

2018 RFP - LCCMR Member Presentation Selection Rankings: Environment and Natural Resources Trust Fund Proposals

Sorted by Funding Priority Category in Rank Order (Highest to Lowest) According to Compiled Member Rankings
(where Member Rankings tie, next sorted by Staff Ranking, then Last Name) [legal size - GREEN SHEET]

Line #	ID #	Member Ranking	Member Conflict	Staff Ranking	Project Title	\$ Requested	Project Summary	Organization	Project Manager	Member Notes	Staff Notes
4	A. Foundational Natural Resource Data and Information (33 Proposals/Subtotal \$24,746,468)										
5	001-A	14		84	Minnesota Geological Survey Geologic Atlases for Water Resource Management Part-A	\$4,121,625	This project continues accelerated production of County Geologic Atlases to support informed management of water and mineral resources. This work is essential to sustainable management of water.	U of MN - MN Geological Survey	Setterholm, Dale	Continue base line effort with goal of accelerating and completing mapping within 15-20 years	- Continuation - Minnesota Geological Survey - M.L. 2017, Subd. 03a "County Geologic Atlases - Continuation", \$2,000,000, thru 6/30/2019 reduced from \$4,729,000 in 2017 legislative session - M.L. 2015, Subd. 03a "County Geologic Atlases - Part A", \$2,040,000, thru 6/30/2018 - M.L. 2013, Subd. 03b "County Geologic Atlases - Part A", \$1,200,000, completed 6/30/2016 - M.L. 2011, Subd. 03b "County Geologic Atlases for Sustainable Water Management", \$1,200,000, completed 6/30/2015 - M.L. 2010, Subd. 03a "County Geologic Atlases and Related Hydrogeologic Research", \$1,130,000, completed 6/30/2014
6	002-A	11		83	County Geologic Atlas for Water Resource Sustainability Part-B	\$2,400,000	County geologic atlases provide information that is essential to sustainable management of Minnesota's groundwater resources by identifying key areas to protect our drinking water and ensure future availability for all.	MN DNR	Putzier, Paul	- I'm interested in how many Part A's are done but Part B maps are not started - Need examples as to where this has been applied for sustainable resources - To assist with real - time natural resource management decisions. Also glad to see the PI already collaborating with the agencies who will use this data in decision making and planning processes. This also appears to have a citizen science element built into the project, but wasn't discussed in detail. I would like to know more about that aspect of the project.	- Continuation - Budget includes \$125,159 proposed for DNR Direct & Necessary expenses - M.L. 2015, Subd. 03b "County Geologic Atlases - Part B", \$2,000,000, thru 6/30/2018 - M.L. 2013, Subd. 03b "County Geologic Atlases - Part B", \$1,200,000, thru 6/30/2017 - M.L. 2011, Subd. 03b "County Geologic Atlases for Sustainable Water Management", \$1,200,000, completed 6/30/2015 - M.L. 2010, Subd. 03a "County Geologic Atlases and Related Hydrogeologic Research", \$1,130,000, completed 6/30/2014
7	003-A	10		70	Providing Critical Water Quality Information for Lake Management	\$477,000	Create a semi-automated system to acquire, process, and deliver new satellite derived water quality data (water clarity, algae, turbidity and color) for all Minnesota lakes ~biweekly and in near real-time	U of MN	Peterson, Jeffrey	- Great opportunity to utilize the most modern data sophisticated satellite data - Great tool if it can really be done in a timely manner - Did other LCCMR past or current projects take satellite data? How did that inform people, groups or agencies? - Innovative	- UMN Water Resources Center
8	004-A	9		70	Minnesota Biodiversity Atlas: Phase II Expansion	\$496,000	We propose to double the size of a natural resource management tool, the Minnesota Biodiversity Atlas, by including state agency observations and specimen records from four additional museum collections.	U of MN	Weiblen, George	- This continues to bring important historical observations into the digital age where it now belongs. These searchable tools are revolutionizing ecosystem sciences - How has this been applied?	- Continuation - UMN Bell Museum of Natural History - M.L. 2015, Subd. 03d "Minnesota Biodiversity Atlas for Enhanced Natural Resource Management", \$340,000, thru 6/30/2018

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9	006-A	9		69	Maximizing Wildlife, Water, and Productivity in Peatland Forests	\$698,000	There are 3 million acres of peatland forests in Minnesota. This proposal will identify management actions that maximize ecosystem benefits of peatland forests, including wildlife, water, timber, and native plants.	U of MN	Windmuller-Campione, Marcella	- A broad area of importance to the northern counties. critical data - Will this help allow some harvest of peat moss for the industry too?	
10	009-A	8		59	Minnesota Trumpeter Swan Migration Ecology and Conservation	\$389,988	Obtain information essential to managing Minnesota's rapidly growing trumpeter swans, using GPS-GSM satellite transmitters to delineate migration patterns and survival, and year-round habitat use and selection.	U of MN	Andersen, David	Species recovery has made these magnificent birds much more visible and in public eye	- Wildlife Research: Trumpeter Swans
11	018-A	8		50	Mapping Avian Movement in Minnesota	\$682,060	Establish network of automated radio telemetry stations to monitor bird migration and local movements of a threatened species, and develop strategic plans for long-term use of infrastructure to monitor animal movement.	U of MN - Duluth NRRRI	Niemi, Gerald	How will this be used with the bird atlas?	- Wildlife Research: Monitoring bird migration & Common Terns - Budget includes \$244,700 for equipment (sensors, antennae's, antennae's towers, transmitters, motus registrations)
12	007-A	7		65	Deer Movement Related to Potential CWD Prion Transmission	\$552,456	Movement ecology of white-tailed deer in southeastern Minnesota as related to chronic wasting disease prion transmission. DNR will radio collar deer to evaluate deer movements and disease transmission potential.	MN DNR	Jennelle, Chris	- Covered already for 2017-18 season. - How is this different or is it a continuation of emerging issues project? - DNR should be doing this with hunting fees	- Wildlife Research: Deer - LCCMR Emerging Issues Account award \$350,000 on 6/21/2017 thru 6/30/2018 - Budget includes \$72,000 for helicopter capture - Budget includes \$150,000 for Iridium satellite data acquisition - Budget includes \$218,206 for collars and monitoring equipment - Budget includes \$20,000 for spotter plane - Budget includes DNR Direct and Necessary expenses \$7,250
13	011-A	7		57	Conserving Minnesota's Turtles through Research and Education	\$364,000	The Minnesota Zoo will improve the long-term viability of Minnesota's imperiled turtle populations by researching threats, implementing mechanisms to reduce mortality, and creating educational materials for use throughout the state.	Minnesota Zoological Garden	Stapleton, Seth	I love turtles!	- Wildlife Research: Turtles - Budget includes \$20,500 for predator exclusion fencing and cameras - Budget includes \$14,000 for GPS Transmitters
14	012-A	7		55	Forest Regeneration – Validating Operational Seed Zones	\$796,395	Minnesota forests ecosystems are maintained by continual reforestation efforts. This project will update guidelines for seed sourcing to ensure that the right seed is being planted in the right place.	U of MN - Duluth	Etterson, Julie	Does DNR have guidelines for seeding? Did LCCMR have a similar project in the past - ensuring plantings are in the right place.	
15	015-A	7		53	Restoring Prairie Biodiversity and Pollinator Habitat with Haying	\$458,362	This project will test how the frequency and timing of haying, used alone or combined with prescribed burning, can promote biodiversity and pollinator habitat in prairie.	Carleton College	Daniel, Hernández		- Wildlife Research: Pollinators and birds

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16	016-A	7		52	Conservation of Minnesota's Forest Birds of Management Concern	\$613,998	Identify forest management actions and guidelines that maximize breeding season productivity across breeding cycle (nesting through post-fledgling) for three bird species of conservation concern: Golden-winged Warbler, Veery, and American Woodcock.	U of MN - Duluth NRRRI	Grinde, Alexis		- Wildlife Research: a Warbler, Veery and a Woodcock species - Budget includes \$20,000 for VHF Radio receivers (4 at \$5,000 each) - Budget includes \$24,000 for drones (4 at \$6,000 each)
17	014-A	6		54	An Early Warning System for Wildlife Health Threats	\$280,000	This project will establish a surveillance system to monitor wildlife health in Minnesota through development of information management and analytical systems utilizing wildlife rehabilitation data.	U of MN	VanderWaal, Kimberly	- Links to rehab data bring an element of citizen involvement and citizen science. Important to have feedback to the rehab centers and to the people who bring in or report wildlife health and welfare. - Long overdue -Would be more comfortable with project if using students to develop online tool.	- Wildlife health monitoring - Budget includes \$83,000 for private company to develop an online tool for surveillance and alert system
18	027-A	6		45	Foundational Assessment of Soil Health Metrics in Minnesota	\$695,477	This proposed work will produce a foundational dataset which can be used to set data-driven statewide soil health goals and establish a baseline soil health assessment for Minnesota.	U of MN	Jelinski, Nicolas		
19	008-A	5		64	Safeguarding Red Pine Forest Health and Productivity	\$420,000	We will produce guidelines to maintain and maximize healthy and diverse pine forests with sustained growth and productivity of our state tree, the red pine, during seasonal and periodic drought.	U of MN	Montgomery, Rebecca	Does DNR have guidelines to maintain and maximize forests?	
20	019-A	4		49	Downstream Effects of Contemporary Forest Practices: Phase 2	\$294,000	Hydrologic data collection and report writing to trace hydrologic and sediment effects of contemporary timber harvest from site to stream and through river network in St. Louis County.	U of MN	Karwan, Diana		- Continuation - M.L. 2015, Subd. 03r "Hydrologic Effects of Contemporary Forest Practices in Minnesota", \$150,000, thru 6/30/2018
21	026-A	4		45	Statewide Wolf Survival Analysis to Build Management Capacity	\$333,179	Developing a statewide wolf-collar database (>250 wolves, ~1995-2018) will deliver urgently needed analysis of survival rates and mortality factors. Results will help support state management, reduce conflict, and inform stakeholders.	U of MN	Bump, Joseph		- Wildlife Research: Wolf
22	028-A	4		44	Cover Crops for Wildlife Phase I	\$346,720	In this proposed innovative study, we capitalize on the already known environmental and agricultural cover crop benefits and determine benefits current cover crop practices provide for wildlife habitat.	Pheasants Forever Inc	Bruse, Tanner	Cover crop research can help with buffer and more options for farmers	
23	013-A	3		55	Assessing Ecosystem Services Provided by Lichens and Mosses	\$213,000	The proposed project aims to better understand the impacts that moss and lichens may have on water and pollution.	U of MN	Stanton, Daniel	Underappreciated	- Wildlife Research: Lichens & Mosses

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24	025-A	3		46	Safeguarding Our St. Louis River Restoration Investment	\$378,949	Team will collect, analyze, and interpret new data using novel, highly structured method of interaction to better restore and manage fish and wildlife habitat in the St. Louis River.	U of MN - Duluth NRRRI	Garono, Ralph		- Budget includes \$8,500 for GIS/remote sensing software - Budget includes \$15,000 for multi-partner meetings (20 days @ \$750 per day) - What is the relationship with the "Smart Mapping St. Louis River Estuary Habitats" proposal? See proposal 021-A
25	005-A	2		69	Building a Long-Term Wetland Hydrology Monitoring Network	\$573,413	This proposal is to fund installation a statewide monitoring network for collecting long-term, foundational data for wetland hydrology. Funds are sought for monitoring equipment acquisition and installation costs.	MN DNR	Norris, Doug	50 sites monitored with data-loggers that have a short life expectancy and require constant "troubleshooting" does not seem like a durable investment. When having 3 sites each across 7 wetland types in only three of MN provinces is this really enough?	- Budget includes \$375,000 for equipment - not broken down - Budget includes \$18,413 proposed for DNR Direct & Necessary expenses
26	010-A	2		59	Improving Watershed Management by Modernizing Hydrography Data	\$1,277,727	Improve watershed management decisions with modern, field-scale spatial data of rivers, streams, lakes, wetlands, and watersheds. This foundational data product will serve as the authoritative source for hydrography in Minnesota.	MN DNR	Hines, Nila	- Do watersheds &/or BWSR have this data? - Concerned with DNR getting more involved with local watersheds and taking enforcement from locals	- Budget includes \$14,733 proposed for DNR Direct & Necessary expense
27	017-A	2		52	Minnesota Soil Microbiomes: Foundational Database for Environmental Health	\$924,000	We will develop a systematic, statewide database of Minnesota soil microbiomes. This will provide a critical foundation to enhance understanding and guide management of Minnesota's environments and microbial natural resources.	U of MN	Kinkel, Linda	A very ambitious project. Do we actually have established categories for pathogenic, invasive and beneficial soil microbes?	- Budget includes \$12,316 for 20 cubic ft. chest freezer - Budget includes purchase and maintenance of database server for \$34,000
28	021-A	2		48	Smart Mapping St. Louis River Estuary Habitats	\$301,000	Produce web-accessible smart maps of St. Louis River Estuary habitats to efficiently display summary information from thousands of biological records for use by resource managers working to restore impaired habitats.	U of MN - Duluth NRRRI	Reschke, Carol		- What is the relationship with the "Safeguarding Our St. Louis River" proposal? See proposal 025-A
29	022-A	2		47	Variable Winter Thermal Regimes and Managing Trout Streams	\$499,935	Winter sport fishing for trout is a vibrant industry, but can be impacted by changing climate. We seek to understand how to conserve trout habitat, especially focusing on winter management.	U of MN	Ferrington, Leonard	Winter rains and warming are the biggest threat to trout spawning	- Fisheries Research: Trout - Budget includes publication costs \$2,000
30	029-A	2		44	Monitoring and Mapping of Mercury in Western Minnesota	\$489,376	We will collect/synthesize Hg information from 50 water bodies in order to better understand Hg hotspots within western Minnesota. Results will support long term monitoring and mapping of this toxin.	Minnesota State University - Moorhead	Kramar, David		- Budget includes \$47,200 for Direct Mercury Analyzer 8230 Tri-Cell + \$9890 in Direct Mercury Analyzer options - Budget includes \$6,000 for Standard Reference Materials - Budget includes \$6,000 for Remote Sensing Software License (2000/year 3 years)
31	030-A	2		43	Data Acquisition to Develop Native Mussel Habitat Suitability	\$309,778	The acquisition of high-resolution sonar data provides important information essential for mapping mussel habitat while having ecological applications useful to resource managers and policy makers protecting Minnesota threatened/endangered native mussels.	National Park Service	Duncan, Nancy		-Wildlife Research: Mussels -High-Resolution Sonar Data acquisition -Budget not broken down very well

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32	020-A	1		48	Maintaining Minnesota's Natural Heritage by Monitoring Landscape Dynamics	\$272,000	This project will create necessary knowledge infrastructure for Minnesota's natural resource professionals and policy-makers by providing ongoing information about landscape dynamics throughout the state at frequent intervals.	U of MN	Knight, Joseph	Remote sensing of landscape changes has different needs for different areas. Urbanizing areas need more frequent data, forests need higher resolution data, etc. Shouldn't we be having a periodic review and update of data needs?	
33	031-A	1		41	Measuring the Impact of Perennial Urban Green Space Management on Soil Ecosystems	\$177,346	Analyzing soil ecosystems impacted by previous land-use management of four urban green spaces (golf course, community park, home lawn, agricultural field) utilizing detailed soil testing, metagenomics analysis, and GPS modeling.	U of MN	Horgan, Brian		
34	023-A	0		47	Four Centuries of Wildfire in Red Pine Forests	\$257,316	Tree-ring-based fire records will be used to reconstruct four hundred years of fire frequency, severity, seasonality, and climate relationships to inform future management of red pine forests in north-central Minnesota.	U of MN	Kipfmueller, Kurt		- Budget includes \$2,500 to convene conference/workshop
35	024-A	0		47	Wetland-biodiversity Vulnerabilities to Changes In Land-use and Climate	\$481,705	We will model satellite and geospatial data to map relative threats land-use and climate changes pose to habitat quality and connectivity, wetlands, and biodiversity on state-owned lands throughout Minnesota.	U.S. Geological Survey	Sadinski, Walt		
36	032-A	0		39	Automated Boulevard Tree Inventory and Urban Forest Management	\$154,656	Build an automated boulevard tree inventory and assessment system which rapidly and inexpensively gathers community tree data, helps manage and develop urban forestry resources, enhances community well-being, and supports education.	St. Cloud State University	Sarnath, Ramnath	Reasonably priced	- Budget includes \$15,000 for GPS-enabled Camera & Mount System (\$5,000 each) - Budget includes \$15,000 for experimental deployment system options - Budget includes \$3,000 for conferences (6-total)
37	033-A	0		37	Tracking and Communicating Ice Safety	\$282,000	Minnesota DNR has reported that 193 people have lost their lives in the last three decades. Mid-winter warmth, road salt lead to uncertainty and higher risk to human safety.	U of MN	Magner, Joe	- Why MIT engineer and not U of MN staff? - Seems like it has value but questions if it really is the mission of the trust fund?	- Budget includes \$25,000 for MIT Engineer
38	B. Water Resources (65 Proposals/Subtotal \$32,197,134)										
39	041-B	16		70	Contaminant Removal Efficiency of Urban Stormwater Treatment Ponds	\$377,588	Urban storm waters contain biologically harmful contaminants of emerging concern whose abatement through best management practice ponds requires evaluation to safeguard habitats for aquatic species from mussels to birds.	St. Cloud State University	Schoenfuss, Heiko		- Budget includes \$230,000 subcontract to USGS
40	035-B	14		75	Wastewater Treatment Plant Optimization Pilot Program	\$236,360	A pilot program of wastewater treatment optimization without costly facility upgrades. This will lead to cleaner lakes and rivers without needless costs, and achieve significantly better treatment results.	Minnesota Pollution Control Agency	Peck, Joel	We need more focus on community sewer options, improvements and assistance.	

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41	037-B	14		73	Investigation of Road Salt Alternatives and Pavement Innovations	\$521,999	We will investigate road salt alternatives and pavement innovations that will reduce or eliminate the flux of chloride from road salt into our lakes, streams and groundwater.	U of MN	Gulliver, John	<ul style="list-style-type: none"> - Investigate what other states do - Chloride levels in lakes in MN a known issue. Chloride in water can effect aquatic wildlife. My understanding is that the reduction of salt use is the only effective tool at this time to address the issue, and having an alternative to road salt would be better. The issue seems to have momentum right now, (for example, Freshwater Society reported a record 270 people who attended their last Road Salt Symposium) if viable alternatives came out of this project, it seems like there is a high likelihood they could/would be incorporated into best practices. - Is the visiting professor currently teaching or doing other research at U of MN or other state institution? 	<ul style="list-style-type: none"> - Budget includes \$76,905 for visiting professor from Valparaiso, IN - Budget includes \$55,000 for T5 pull-behind road friction measurement trailer - Budget includes \$11,000 for a walk-freezer - M.L. 2016, Subd. 04n "Understanding Impacts of Salt Usage on Minnesota Lakes, Rivers, and Groundwater", \$497,000, thru 6/30/2019
42	048-B	14		63	Small Cheap Purification System for Cleaner Drinking Water	\$496,788	This project is to develop a small cheap purification system for community drinking water facilities to remove toxic contaminants. The technology is highly efficient to improve current drinking water quality.	U of MN	Cui, Tianhong	What does the PI estimate prices for units can come down to? In other words, how is the PI defining 'cheap'?	- It is unclear if this is for an under the sink filter or community scale system
43	057-B	13		60	Preventing Nitrate Contamination of Groundwater Using Perennial Grains	\$759,312	Establish and monitor 120 acres of intermediate wheatgrass (Kernza), a new perennial grain crop, in vulnerable wellhead protection regions of Minnesota to profitability reduce nitrate leaching to drinking water.	Minnesota Department of Agriculture	Peterson, Heidi	<ul style="list-style-type: none"> - Perennial is key, what about chemicals? - Are landowners participating in project being paid, if yes, what? Is the City of Chatfield or LPRW providing any in-kind services? What is plan to fund final years of project? - Seems costly for so few acres. Maybe cut back. 	<ul style="list-style-type: none"> - Indicated to be Phase 1 (2 years) of a long-term (6-10 years) study to reduce groundwater nitrate contamination in high-risk, wellhead protection areas using intermediate wheatgrass - Budget not well broken down - Budget includes \$48,000 for land rental - Budget includes \$2,500 for publication costs
44	034-B	10		76	Removing Plastic Particle Pollution from Minnesota Water Bodies	\$388,557	The objective of the present proposal is to assess and provide remedy to the urgent problem of microscopic plastic particles polluting water bodies in Minnesota.	U of MN	Coletti, Filippo	<ul style="list-style-type: none"> - Needs a strong education component for prevention - With public awareness efforts will be there be education on source of microplastics and actions citizens can take in their own lives for prevention? 	- St. Anthony Falls Laboratory-UMN
45	054-B	10		61	Emerging Pathogens in Lakes, Rivers, and Tap Water	\$355,244	This research project will provide critical information regarding how to treat surface water (used by 25% of Minnesota's population) to prevent outbreaks of Legionnaires' disease and infections by Mycobacterium avium.	U of MN	LaPara, Timothy		- Budget includes \$5,000 for publication costs
46	038-B	9		72	Biological Sulfate Removal for Wastewater Treatment in Minnesota	\$494,000	Goal of the project is to improve Minnesota's water quality by removing sulfate from wastewater. The project will provide best management practices to integrate sulfate removal into wastewater treatment operations.	U of MN	Behrens, Sebastian		<ul style="list-style-type: none"> - Budget includes equipment for 6 bioreactors \$35,000 - Budget includes in-state conference and travel \$2,000

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47	039-B	9		71	Defining Minnesota's Environmental Antibiotic and Antibiotic Resistance Footprint	\$921,584	We will quantify and map antibiotic and antibiotic resistance gene contamination in Minnesota waters and soils and identify locations in need of mitigation to protect environmental, human, and animal health.	U of MN	Singer, Randall	- Does this build off previous LCCMR appropriations? - Too costly	- Budget includes \$13,000 for open-access publication charges - Budget includes \$6,500 for in-state conferences - M.L. 2014, Subd. 03e "Antibiotics and Antibiotic Resistance Genes in Minnesota lakes", \$300,00, completed 6/30/2017 - M.L. 2013, Subd. 05h "Antibiotics in Minnesota waters - Phase II Mississippi River", \$203,000, completed 6/30/2016 - M.L. 2011, Subd. 05e "Assessment of Minnesota River antibiotic concentrations", \$190,000, completed 6/30/2014
48	045-B	9		66	Developing a Map of Arsenic Risk in Groundwater	\$550,000	Over 20% of private wells in west- and south-central Minnesota exceed the arsenic standard. Proposed arsenic risk map will transform 20 years of arsenic research into access to cleaner groundwater.	U of MN	Ng, G.-H. Crystal	- Have a question on data collection for this risk map. Proposal states map will serve 26 arsenic prone counties , but will only select 6 drilling locations in regions of concern. What other data collection goes into the models and what is the level of uncertainty they are aiming for in the model? - Unsure	- Budget includes \$24,225 for 3 groundwater wells - Budget includes \$14,560 for sediment analysis at Lawrence Berkley National Lab (CA); instrumentation not available in-state
49	042-B	6		68	Rapid Detection of Algal Toxins in Minnesota Lakes	\$686,013	We will use novel genetic and toxin characterization techniques to develop DNA based indicators of toxin risk. Citizen scientist sampling will be used to evaluate risk model application statewide.	U of MN - Duluth NRRI	Bramburger, Andrew	How does this relate or how is it different to current LCCMR projects on toxic algae blooms?	- Budget includes \$19,560 for a YSI EX02 Water Quality Sonde
50	064-B	6		56	Unregulated Contaminants: Addressing Gaps in Drinking Water Protection	\$2,107,920	This project will characterize unregulated drinking water contaminants at wells and intakes (which pump from groundwater, lakes, rivers), and to examine if they persist after standard public water system treatment.	Minnesota Department of Health	Robertson, Stephen	- What is status of pending funds? Why using private labs? - Expensive. Opens a pathway to more regulations potentially on local communities.	- Proposal lacks details - Staff score reflects lack of details - Budget includes \$1,130,400 for private analytical laboratories
51	067-B	5		54	Innovative Technology to Remove Nitrate from Surface Water	\$173,847	To develop an innovative technology to remove nitrate from surface water that is flexible enough to be used in household, large scale public utility system and in farm/livestock industry.	St. Cloud State University	Sivaprakasam, Kannan	Great priced research. Like the broad application options.	- Budget includes \$20,000 for Planetary Ball Mill to crush large particles into nano powders
52	068-B	5		54	Rural Wastewater Treatment: Water Reuse and Energy Production	\$297,000	This project aims to develop a rural wastewater treatment system that could replace septic tanks, decreasing pollution entering rivers and lakes and increasing potential water reuse and energy generation.	U of MN	Zamalloa, Carlos	Great project, big concerns in this issue area, so good if trust fund can help.	- Budget includes publication costs \$3,000 - No results received yet from previous ENRTF appropriation - M.L. 2014, Subd. 08g "Next Generation Large-Scale Septic Tank Systems", \$258,000, completed 6/30/2017
53	086-B	5		44	Optimal Configuration of Windbreaks for Agricultural Water Conservation	\$368,614	This proposal aims to develop a predictive tool that enables optimal configuration of windbreaks, canopy, and wind turbines for reduction of farm-scale water loss due to soil evaporation.	U of MN	Ebtehaj, Ardeshir		- Budget includes \$20,000 for H2O Open-path Gas Analyzer and 3-D Sonic Anemometer
54	036-B	4		73	Phosphorus Accumulating Fungi to Control Agricultural Runoff Pollution	\$361,000	This project will utilize non-mycorrhizal fungi that can access insoluble soil phosphorus to significantly decrease needs for phosphorus fertilizers and reduce phosphorus pollution to our water and lakes.	U of MN	Bushley, Kathryn	Interesting project	- Wildlife Research: Mycorrhizal fungi

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55	047-B	4		66	Natural Denitrification: Helping and Hiding Drinking Water Problems	\$664,000	Natural denitrification is beneficial for protecting drinking water from nitrate contamination, but it may hide aquifer vulnerability to other contaminants (pesticides or chloride). Project will measure and map natural denitrification.	U.S. Geological Survey	Trost, Jared	What is status of pending funds from DNR, MDH & MDA staff? How do they prioritize this project? What is status of USGS funds for the project?	- Minnesota Water Science Center-USGS - Budget includes all USGS Personnel - Budget includes \$10,000 for USGS contract fee for report writing, publication costs and conference fees
56	055-B	4		60	Working Farmlands: Targeting Alfalfa Production for Water Protection	\$752,913	We will develop a farmer-led, market-based working lands approach for protecting water by targeted expansion of alfalfa production, and enable farmers to take this approach by expanding markets for alfalfa.	U of MN	Jordan, Nicholas	What is status of pending funds? My budget no. for activity 3 is not readable.	- Budget includes \$15,000 for Process Equipment - Budget includes \$36,353 for travel - Budget includes \$3,500 for hosting forum speakers
57	058-B	4		59	Preventing Lake and Stream Pollution from Stormwater Ponds	\$535,740	We will develop tools to cost-effectively identify stormwater ponds requiring rehabilitation, and to investigate and evaluate techniques to mitigate the lake and stream pollution that results from these ponds.	U of MN	Gulliver, John		- St. Anthony Falls Laboratory-UMN - Budget includes \$37,332 for visiting professor from Valparaiso, IN
58	094-B	4		37	ShellRock River Watershed Stormwater Quality Trading Pilot Program	\$350,000	This project will develop and implement a model stormwater water quality credit trading framework. The purpose is to provide voluntary, cost effective, pollutant reductions on a watershed scale.	Shell Rock River Watershed District	Christensen, Courtney	Need more budget info. Did Shell Rock River Watershed District get funding in the past from LACCMR or legislature and how does this project relate.	- Budget includes potentially ineligible expenses - Unclear what pollutants or how much they would be reduced
59	044-B	3		66	Wetland Contribution to Methylmercury Pollution of Surface Waters	\$567,604	Create design guidelines for agricultural wetlands to optimize nitrate removal while reducing potential toxic methylmercury production, and develop a tool to assess methylmercury pollution risk in Minnesota lakes and streams.	U of MN	Janke, Benjamin		- Proposal fits with the Minnesota Statewide Mercury Implementation Plan specifically efforts to identify and mitigate processes that increase mercury uptake in fish and explore ways to reduce transport and methylation of mercury once deposited in watersheds. - Budget includes \$90,000 to Gustavus Adolphus College for mercury analysis - Budget includes \$10,000 for 2 Outreach workshops (printing, venue rental, facilitators) - Budget includes \$2,000 for publication fees in open-access journal - Budget includes \$1,000 to attend MN Water Resource Conference
60	049-B	3		63	Bounty and Outreach Program for Enhanced Recovery of Unwanted Mercury	\$467,000	MPCA proposes a mercury bounty and outreach program for enhanced recovery of unwanted mercury, to protect human health and reduce mercury emissions to meet statewide water quality protection goals.	Minnesota Pollution Control Agency	Gilkeson, John	Bounty on mercury, seems odd, so want to learn more.	- Funds bounty for items containing mercury - How much is out there and how much of a risk/pollution reduction will occur?
61	053-B	3		61	Rise and Fall of Superior: Water and Security	\$406,000	Lake Superiors water level is critical to Minnesota's economy. We will provide science to make level predictions, determine critical knowledge gaps, and prepare communities and industries for water level change.	U of MN - Duluth	Downing, John		- Minnesota Sea Grant-UMN Duluth - Budget includes \$53,670 for travel

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62	056-B	3		60	Water Quality Through Capture/use of Agricultural Runoff	\$600,000	More water storage in agricultural landscapes is essential for protecting water, but expensive. We will develop a cost-effective approach benefiting water and wildlife by capturing runoff for use in irrigation.	U of MN	Lewandowski, Ann		- UMN Water Resources Center - It is not clear how much \$ each entity listed in the proposal will receive - Budget includes \$6,000 for publication costs (4 @ \$1,500) - Budget includes \$30,000 for flumes & samplers for 3 ponds
63	065-B	3		55	Lake Restoration: Benefits and Duration in Agricultural Landscapes	\$459,356	We will quantify nutrient reduction benefits and anticipated duration from lake restoration in agricultural regions of Minnesota. Priority lakes for restoration will be identified using nutrient, social and economic data.	U of MN	Hansen, Amy		- St. Anthony Falls Laboratory-UMN - Budget includes \$5,000 for BioBase subscription fee - Budget includes \$2,000 for publication fees
64	071-B	3		53	Sulfide Mineral-eating Microbes to Improve Water Quality	\$339,667	Naturally occurring microorganisms break down sulfide minerals from Minnesota's copper-nickel deposits. If we can understand this process, we can use microorganisms to improve management of mine waste and water.	U of MN	Jones, Daniel		- Budget includes \$5,000 for benchtop muffle furnace - Travel and conference costs are not broken down - Budget includes regional Society for Mining, Metallurgy, and Extraction (SME) conference - Budget includes \$5,000 for publication costs
65	072-B	3		53	Increasing Contaminants and Temperature Eliminate Minnesota Turtles	\$248,632	Quantifying factors, including estrogenic contaminants and rising temperature, responsible for turtle decline in Minnesota Lakes to provide natural resource managers opportunities to remediate sensitive habitats and stabilize populations.	St. Cloud State University	Kohno, Satomi		- Wildlife Research: Turtles - Budget includes \$13,417 for Environmental chamber for egg incubation
66	074-B	3		53	Minnesota's Coldwater Fish Decline: Causes and Solutions	\$789,021	Determine long-term causes of fish loss and develop management recommendations for rehabilitation of coldwater fisheries in hundreds of lakes. A collaboration with the MNDNR to enhance the sentinel lakes program.	U of MN - Duluth NRRRI	Reavie, Euan		- Wildlife Habitat Research: Coldwater fish - Budget includes \$3,184 for Minnesota Water Resources Conference
67	082-B	3		48	Water Quality Benefits of Red River Basin Impoundments	\$495,042	Surface water management and biomass harvesting within impoundments can capture non-point source nutrients and sediment. This project will evaluate and enhance management of retention projects to maximize water quality improvements.	Red River Basin Commission	Ostlund, Aaron	Valuable info for future projects.	- Budget includes \$150,000 for RMB Environmental Laboratories - Budget includes \$30,000 for North Dakota State University - Budget includes \$8,000 for Automated water collection equipment - Budget includes \$10,000 for printing of outcome reports and education materials - M.L. 2014, Subd. 06h "Nutrient Capture Through Water Management and Biomass Harvesting", \$300,000, 6/30/2017 completed
68	096-B	3		34	Creating a Algal Toxin Alert Network for Central and Upper Minnesota	\$154,630	The goal of this project is to create a rapid algal toxin detection network for portions of northern and central Minnesota, with the potential for low cost statewide expansion.	St. Cloud State University	Julius, Matthew	More affordable research. Wasn't this like the UMD proposal too, but that was much more expensive? So, do this instead.	- Budget includes \$103,130 for a FlowCam Digital Algal Quantification System

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69	040-B	2		70	Promoting Nitrogen Removal in Channels, Floodplains, and Riparian Areas	\$390,641	The goal is to develop a tool to quantify nitrogen removal in floodplains and riparian areas to inform best management practices and promote clean water conditions across the landscapes of Minnesota.	U of MN	Hondzo, Miki		- St. Anthony Falls Laboratory-UMN - Budget includes travel to in-state conferences \$2,000
70	043-B	2		67	Hydro acoustic Monitoring to Understand Sediment Impacts - Phase 2	\$328,640	Installation of streamgage web cameras and development of an online real-time sediment network maximizes sediment monitoring efforts of several agencies and better disseminates collected information to the general public.	U.S. Geological Survey	Groten, Joel	Interesting, but what can be done to then clean out sediment in problem areas?	- Continuation - Minnesota Water Science Center-USGS - M.L. 2015, Subd. 04g "Using Hydroacoustics to Monitor Sediment in Minnesota Rivers", \$455,000, thru 6/30/2019
71	046-B	2		66	Improving Agricultural Sustainability on Irrigated Sandy Soils	\$470,000	This project will explore the use of innovative planting configurations and new nitrogen fertilizer technology to sustain potato productivity and reduce nitrate leaching to groundwater under irrigated conditions.	U of MN	Rosen, Carl	Good to do	- Continuation of M.L. 2005, Subd. 07i "Improving Water Quality on the Central Sands", \$587,000, 6/30/2010 completed - What about pesticides and fungicides?
72	050-B	2		63	Linking Food, Energy, and Water For Resource Recovery	\$941,600	Technological innovations will integrate the treatment of water from the food- and beverage-processing industry, energy generation, and greenhouse-based crop production for resource recovery, water conservation, and better water quality.	U of MN	Novak, Paige	- Is this practical? - Interested to know more on innovation.	- Budget includes \$160,000 for laboratory supplies and analytical costs including chemicals for all analyses, supplies to maintain analytical equipment, supplies for reactor construction, pumps, seeds, analytical fees), space rental costs for greenhouse studies, also marketing survey costs, and publication fees (\$30,000/3 years) - Budget includes \$25,000 for Additional Items costs to develop business plans, perform patent search, and market analysis.
73	051-B	2		63	Hydrochars to Remove Nitrates from Agricultural Drainage	\$359,000	A modified hydrochar that will reduce the amount of unwanted nitrates in agricultural waters and also improve agricultural sustainability through recycling the nitrate nutrients will be developed from agricultural residues.	U of MN	Valentas, Kenneth		- Continuation of M.L. 2015, Subd. 04d "Preventing Phosphorous and Pesticides from Entering Water Resources Through Drain tiles", \$505,000, thru 6/30/2017
74	059-B	2		57	Developing Nutrient Separation Systems for Livestock Environmental Sustainability	\$304,000	This project will develop an economical manure nutrient separation system. The separation system will produce environmentally sustainable fertilizers and ameliorate the water environmental impact of Minnesota livestock operations.	U of MN	Lin, Hongjian	Doesn't this already exist in places?	- Budget includes publication costs \$3,000 - Budget includes \$15,000 for equipment to build pilot-scale device
75	066-B	2		55	Predicting Impact of Oil Spill in Minnesota Lakes	\$394,948	We will develop urgently-needed monitoring, measurement, and prediction tools for trajectory estimation and remediation strategy of spilled oil in Minnesota lakes, to assist decision makers in coping with oil spills.	U of MN	Lee, Sungyon	Not a great need. When was last MN oil spill in a lake? Don't recall one.	- Budget includes \$25,000 for setting up oil-in-water experiment facility

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76	070-B	2		53	Nutrient Removal and Recovery Technology for Agricultural Drainage	\$880,000	The goal of this project is to improve water quality by removing nitrogen and phosphorus from agricultural runoff water, and to reclaim these nutrients for use as animal feed.	U of MN	Ishii, Satoshi	Interesting, but too expensive.	- Budget includes 3 lab-scale bioreactors \$15,000 - Budget includes 3 field-scale bioreactors \$30,000 - Budget includes \$8,000 for publication costs, poster and handout printing
77	075-B	2		53	Water Saving Subsurface Irrigation to Reduce Contamination	\$93,391	We investigate below-ground irrigation to 1) reduce water use, 2) reduce operational cost, and 3) reduce pollution of both groundwater and surface water. A construction manual will be created.	U of MN	Strack, Otto		
78	077-B	2		52	Establishing Priorities for Restoring Minnesota's Nutrient-impaired Lakes	\$375,000	Over 350 Minnesota lakes are impaired with excess nutrients and noxious algae. This project will target restoration efforts toward the most imperiled and recoverable lakes to maximize resources and success.	Science Museum of Minnesota	Edlund, Mark		- St. Croix Watershed Research Station
79	081-B	2		48	Web-GIS for Satellite Monitoring of all Minnesota Lakes	\$393,506	This proposal aims to develop a modern publically accessible Web-based Geographic Information System (Web-GIS) for low-cost and super-resolution water quality monitoring of almost all Minnesota lakes from space.	U of MN	Ebtehaj, Ardeshir		- St. Anthony Falls Laboratory-UMN - Budget includes \$61,255 for a FieldSpec 4 Hi-Res Spectroradiometer - Appears to be equipment and infrastructure for SAFL
80	092-B	2		39	Geospatial Airborne Sensor Survey to Manage Water Resources	\$999,768	This project seizes immediate opportunities to employ aerial sensors and other GIS technology through the use of drones to capture high resolution...real time...3-dimensional data for active management of watershed challenges.	Northland Community and Technical College	Bergee, Anton		- Budget includes \$119,600 for 2 drones with LiDAR - Budget includes \$58,400 for 2 drones with Near IR, Survey Sensors - Budget includes \$23,060 for ArcGIS software for 2 years - Need other funds explained better - Outcomes not clear
81	093-B	2		39	A Landscape Conservation Design for the Lower St. Louis River	\$397,000	This project develops a watershed-scale conservation plan to guide continued recovery of fish and wildlife habitat and populations of the lower St. Louis River, western Lake Superior's most important river.	Minnesota Land Trust	Peterson, Daryl		- Implementation of existing plans are already underway such as the "St. Louis River Area of Concern Implementation Framework: Roadmap to Delisting (Remedial Action Plan Update)" from July 2013 MPCA and "Implementation Plan for the St. Louis River Estuary Habitat Focus Area" National Oceanic and Atmospheric Administration January 2016 amongst others.
82	052-B	1		62	Characterizing Fractured Bedrock to Assess Pollution Risk to Groundwater	\$330,000	The project involves developing tools to quantitatively assess the site-specific environmental impact of a given contaminant source as controlled by the regional permeability of fractured bedrock.	U of MN	Guzina, Bojan		- Budget includes \$16,000 for Syringe Pump
83	060-B	1		57	Improving Water Quality by Capturing Sulfate in Wetlands	\$578,000	The overall goal of this project is to provide effective strategies for removing excess sulfate, a priority pollutant, from mining discharge waters in northeastern Minnesota and improving water quality.	U of MN	Santelli, Cara		- Budget includes \$7,800 for Argonne National Lab in Chicago for sulfur analysis (Not available in MN)

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84	061-B	1		56	Natural Nitrogen Fertilizer Production with Low-Runoff Potential	\$727,000	The goal of this project is to leverage success optimizing a nitrogen-fixing bacterium to construct a sustainable route to inexpensive biologically derived fertilizers with low-runoff potential.	U of MN	Barney, Brett	Seems like expensive research.	- Budget includes \$80,000 for Biomass Processing Reactor design and components - Budget includes \$40,000 for Electrode Construction - Budget includes \$3,000 for publication costs
85	063-B	1		56	Benefits of Lake Plant Diversity for Water Quality	\$463,113	We predict that aquatic plant diversity will benefit water quality in lakes. We will test this in shallow lakes throughout Minnesota, leveraging the Sentinel Lakes program for this research.	U of MN	Larkin, Daniel		
86	076-B	1		53	Protecting Fish Habitat in Streams From Groundwater Withdrawal	\$93,391	We propose a method to withdraw groundwater near streams without damaging fish habitat. A construction manual will be delivered. This project will allow pumping, e.g., for irrigation, without damaging fish.	U of MN	Strack, Otto	Good for irrigation	
87	078-B	1		52	How does Iron Protect Wild Rice from Sulfate?	\$401,142	Iron in sediments is protective of wild rice, but only partially. Our study will determine the balance of beneficial and harmful effects of iron on the sustainability of wild rice.	U of MN - Duluth	Johnson, Nathan		- Budget includes \$5,123 for Publication fees and document dissemination
88	079-B	1		50	Determining the Impact of Microfibers on Septic System Performance	\$367,000	Project will determine the impact of microfibers on septic systems and evaluate options to reduce the microfibers in graywater from laundering clothing currently passing through various septic system and WWTPs.	U of MN	Heger, Sara		- UMN Water Resources Center
89	083-B	1		48	Incentivizing Oilseed Cash Cover Crops for Water Quality Improvement	\$1,320,000	Through a market-based approach, this project will protect water resources by increasing the marketability and adoption of oilseed cash cover crops into annual row crop agricultural production systems across Minnesota.	U of MN	Wells, M. Scott	Good to see them using a market driven approach to help solve problems.	- Budget includes \$26,340 for Refurbished Gas Chromatograph with Mass Spectrometer - Budget includes \$3,000 for conferences - Budget includes \$30,000 for lease/rent of project truck - Budget includes \$50,000 for 25 internship scholarships
90	087-B	1		44	Sediment Impairments in Northern Minnesota Non-Agricultural Streams	\$335,000	In-stream particle/sediment formation is common in wetland streams. This project quantifies terrestrial and in-stream source contributions to sediment-impaired streams, emphasizing seasonal and hydrologic influences on in-stream sediment formation processes.	U of MN	Karwan, Diana		- Budget includes \$16,700 for continuous discharge sensor & data logger (2 @ \$8,350) - Budget includes \$12,000 for Multi-probe sensor & data logger (2 @ \$6,000)
91	090-B	1		41	Determining Which Iron Minerals Remove Phosphorous from Stormwater	\$384,591	Iron-enhanced sand filters installed throughout Minnesota are exhibiting mixed effectiveness. We hypothesize that only certain iron minerals will remove phosphorous from water; we propose to determine which minerals work.	U of MN	Feinberg, Joshua		- Budget includes \$29,292 for experimentation costs and consumables for iron mineral characterization

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92	097-B	1		34	A Multi-faceted Approach Towards Reducing Nitrogen Inputs and Loss in Urban Landscapes	\$284,300	Using in-person assessments to determine actual amount of fertilizer applied to lawns in conjunction with biological nitrification inhibition techniques to reduce amount of fertilizer applied to lawns.	U of MN	Trappe, Jon		
93	098-B	1		25	Farmer Generated Water Quality Solutions	\$348,000	We are proposing an innovative farmer centered approach to define, plan and implement a watershed level strategy to address water quality issues in the Elm Creek Watershed in southern Minnesota.	U of MN	Current, Dean	Local control is good.	
94	062-B	0		56	Re-connecting Fish Habitat at Road-Stream Crossings	\$474,689	We will quantify the impact of culverts on fish movement to enable designers and resource managers to preserve fish populations by prioritizing passage at road-stream crossings with the biggest impact.	U of MN	Kozarek, Jessica		- Fisheries research - St. Anthony Falls Laboratory-UMN - Budget includes \$6,000 for Backpack electrofisher - Budget includes \$46,216 for travel - Budget includes \$20,000 for eDNA Laboratory costs
95	069-B	0		53	Microbial Transformation of Plastics in Minnesota Waters	\$506,000	This project will study the ability of indigenous bacteria to biodegrade plastics found in contaminated waters across the state of Minnesota and determine their fates and potentially toxic by-products.	U of MN	Barney, Brett		- Budget includes \$11,000 for R/V Blue Heron/Kingfisher research vessel rental
96	073-B	0		53	How Rapidly Can Groundwater Quality Be Improved?	\$716,000	Aquifers in southeastern Minnesota have continually received excessive doses of anthropomorphic chemicals such as nitrates since WWII. We will estimate how long it will take to make them clean again.	U of MN	Nieber, John		- Budget includes \$35,000 for model groundwater system
97	080-B	0		48	Non-invasive, Cost-effective Investigation of Groundwater Resources	\$93,783	Management of groundwater resources is hampered by our limited knowledge of the structure of aquifers. This proposal will use a new method to reveal the subsurface distribution of this resource.	U of MN	Bezada, Maximiliano		
98	084-B	0		48	Reducing Water Nitrogen to Restore Minnesota Lakes	\$362,000	This project will improve water quality in shallow lakes by developing management strategies that reduce nutrient levels and reduce blooms of noxious and toxic cyanobacteria.	University of St. Thomas	Zimmer, Kyle		- Budget includes \$243,000 for subcontract for UMN microbial ecologist
99	085-B	0		46	Assessing Water Quality in Mississippi Headwaters Region Lakes	\$406,200	The goals of this project are to preserve, analyze, interpret, and augment historical water quality data for lakes with minimal, but increasing, external stressors to inform statewide lake management strategies.	U of MN	Knoll, Lesley		- UMN Itasca Field Station - Budget includes \$11,000 for Fluorometer - Budget includes \$1,500 for in-state conference - Budget includes \$2,000 for publication costs
100	088-B	0		44	Maximizing Water Safety Against Antibiotic Resistance	\$350,000	The proposed research will establish comprehensive experimental and informational framework for surveillance and monitoring of the effects of antibiotic use on the spread of antibiotic resistance.	U of MN	Khodursky, Arkady		

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101	089-B	0		43	Polycyclic Aromatic Hydrocarbons Abatement Using Non-thermal Plasma Technology	\$820,000	The proposed project is aimed to develop an innovative non-thermal plasma based technology for the cost effective and sustainable removal of polycyclic aromatic hydrocarbons from Minnesota air and waters.	U of MN	Ruan, Roger		- Budget includes \$15,000 high voltage power supply - Budget includes \$15,000 plasma monitor & analyzer - Budget includes \$165,000 equipment for demo systems & reactors
102	091-B	0		41	Better Fertilizer Management to Prevent Further Water Contamination	\$392,000	To prevent more nitrate pollution from agricultural operations, we will develop an online fertilizing recommendation tool that integrates airborne remote sensing with advanced crop models.	U of MN	Yang, Ce		- Budget includes \$5,000 for drone with imager
103	095-B	0		35	Guidelines for Sustainable Biomass Production for Multiple Benefits	\$192,000	This project will develop widely accepted guidelines for sustainable biomass production ensuring that the state environment benefits from implementing biomass plantings for production and conservation purposes.	U of MN	Current, Dean		
104	C. Environmental Education (33 Proposals/Subtotal \$12,581,000)										
105	101-C	10		64	Connecting Students with Watersheds through Hands-on Learning	\$581,270	Students will get outdoors for hands-on learning focused on water quality, groundwater, aquatic life, watershed health and their role as watershed stewards. Introductions to fishing and conservation will be offered.	Minnesota Trout Unlimited	Lenczewski, John	Has LCCMR funded bus transportation in the past (I know we discussed). National Fishing in the Schools provides matching grants if funds are available - is project requesting a match from that program?	- Continuation - Budget includes \$44,050 for Aquarium equipment and maintenance - Budget includes \$35,000 for National Fishing in the Schools program - Budget includes \$100,800 for Bus transportation - Budget includes \$45,000 for Student Summits - M.L. 2015, Subd. 05b "Connecting Students with Watersheds through Hands-On Learning", \$400,000, thru 6/30/2018
106	121-C	10		49	River Watch on the Minnesota River	\$103,000	Continue and expand a River Watch program on the Minnesota River engaging teams of high school students in water quality monitoring and reporting the data to the MNPCA	Friends of the Minnesota Valley	Suss, Ted		- See 113-C "Minnesota River Education Model: Connecting Students to Watersheds" and 119-C "Minnesota River Water Quality Education" for similar proposal - Budget includes \$13,000 for 2 YSI Sonde Multi Function Water Monitoring Probes - Budget includes \$20,000 for 2 Minnesota River Basin Wide forums

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107	099-C	9		69	Increasing Diversity in Environmental Careers: Fellowships, internships, Mentorships	\$1,000,000	This collaborative project creates a college to workforce pathway for under-represented students who are interested in pursuing Natural Resources careers by reducing barriers that inhibit successful educational attainment.	MN DNR	Legato, Denise	- Greatly needed - We need programs that encourage/promote a more diverse workforce. Programs such as this provide support for students trying to navigate a field where they are traditionally under-represented and otherwise may not feel like they have the resources to navigate this career path. Will ongoing student assessments include follow-up with students after they graduate to see if they continued on into environmental careers? - Why does DNR feel it needs entire \$1.4M before any money on project can be expended. What is the difference between fellowships and internships? What if started with 40 students and if works - come back for more funding. Why not implementing mentors & internships until 2019 & 2020?	- Resubmitted proposal from 2017 - Budget was reduced from \$1,000,000 to \$487,000 in 2017 legislative session - Budget states "\$487,000 received in ML2017 Chp. 96; no funding will be expended until additional \$1 million is secured." from this proposal - Budget includes \$28,237 proposed for DNR Direct & Necessary expenses - M.L. 2017, Subd. 05b "Increasing Diversity in Environmental Careers", \$487,000, thru 6/30/2022
108	102-C	9		63	Pollinator Ambassadors for Urban Gardens	\$421,431	The Pollinator Ambassadors for Urban Gardens project will enhance outreach capacity for pollinator education by creating an outreach toolkit and training educators and youth for engagement in native pollinator education.	U of MN	Evans, Elaine	Best group to do this education	- Budget includes \$111,146 for 30 Pollinator Ambassadors to train youth age 15-18 to gather data and information on urban pollinator plantings
109	109-C	9		58	Phase 2 Prairie Sportsman Statewide Environmental Education Project	\$300,000	Produce, broadcast and share 26 science-based environmental programs, 26 "call to action" and 27 "outdoor lifestyle" videos that inspire and demonstrate how to protect and engage with Minnesota's natural resources.	Pioneer Public Television	Bakken, Timothy	- What is viewership? - What is their viewership? - What is status of current project? Are shows being well received & watched?	- Continuation - M.L. 2016, Subd. 05d " New Prairie Sportsman Statewide Broadcast Video Project", \$300,000, thru 6/30/2019
110	111-C	8		57	Youth Convening Minnesota	\$300,000	Educating and engaging youth is critical to maintain and improve our heritage in natural resources. We will mentor youth and youth leaders to work with communities to address environmental issues.	Climate Generation: A Will Steger Legacy	Poppleton, Kristin		- Resubmitted proposal from 2017
111	112-C	8		53	Get Outdoors After School!	\$30,000	This project will equip out-of-school youth organizations across Minnesota with knowledge, skills and resources to incorporate outdoor nature activities into after-school programs and engage under-privileged children with the outdoors.	Project Get Outdoors, Inc.	Holger, Sara		- Project time line is not correct (appears to begin July 2018 and ends June 2018) - Budget includes \$26,000 for Activity Backpacks & Outdoor Equipment Kits - M.L. 2010, Subd. 08h "Project Get Outdoors", \$15,000, completed 11/16/2010
112	127-C	8	1	45	Preparing Minnesotans for Changes in Wolf Management	\$1,200,000	Minnesotans need to understand the complexities of successful state-controlled management, conflict resolution, and co-existence with our 2,400 wolves. A new educational exhibit at the International Wolf Center will help.	International Wolf Center	Kline, David		- Construction of a Wolf Discovery Center - Budget not broken down well - Very little information or details in the proposal so it is difficult to rank

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113	115-C	7		52	Students Using Local Phenology Contributes to Citizen Science	\$224,000	Students lack real data to make STEM learning relevant. Partnering with nature centers and schools, this project trains a network of 1000 students to collect and analyze citizen science data.	U of MN	Carlson, Stephan		- Continuation - Budget includes \$19,000 for Signage for Phenology trails - Budget includes \$2,000 for Community Festival Nature Center events - Budget includes \$1,000 for conference presentation - M.L. 2014, Subd. 05e "Assessing Species Vulnerability to Climate Change Using Phenology", \$175,000, completed 6/30/2017
114	116-C	7		52	Strengthening Natural Resources Management with Drone Training	\$132,000	The goal of this project is to provide training to enable natural resource professionals to effectively use drones in restoring, protecting, and managing natural resources.	U of MN	Knight, Joseph	Making sure we have natural resource staff educated in drone use is very important as the technology has huge potential for several areas of natural resource management. Questions for PI: Several agencies that could benefit from this training were listed, but none as project partners. Have they expressed desire for this training? How many of these agencies have access to drones?	
115	108-C	6		59	Preserve Resources by Expanding the State's Reuse Sectors	\$363,910	This project will focus on creating a much more robust reuse economy throughout the State resulting in reduced solid waste, less pollution, more jobs, and small business development.	ReUSE Minnesota	Thomas, Steve		- Continuation - How does this relate to the proposal "Preserve Resources by Expanding the State's Reuse Sectors"? See proposal 164-E - M.L. 2015, Subd. 07c "Building Deconstruction to reduce Greenhouse Gas Emissions and Solid Waste", \$1,000,000, extended in 2017 session thru 6/30/2018
116	114-C	6		53	Integrating Environmental Science Research in High School Education	\$445,000	Working with researchers, 40 teachers statewide will integrate environmental research in their classrooms engaging students in scientific processes. Students will participate in ongoing scientific research and present at UofM	U of MN	Yakub, Mohamed	Element of getting teachers involved in research during their summers is highly attractive. Experience for teachers will expose them to resources to bring back to their classrooms - including real-life examples and professionals in the field to contact with questions in the future.	- What is the relationship with the "Providing enduring ecology experiences for all Minnesota middle-schoolers" proposal? See proposal 100-C - Budget includes \$12,000 for High school teachers @ conferences - Budget includes \$4,000 for substitute teachers - Budget includes \$200,000 for stipends to teachers
117	118-C	6		50	Morris Prairie Pollinator Demonstration and Education	\$681,000	Project will restore and demonstrate a native prairie habitat in order to enhance the local ecosystem for beneficial pollinators as well as to offer educational opportunities.	U of MN - Morris	Poppe, Steven	Who owns the land and what are they contributing towards the project. Who will own and maintain the kiosks, shelters, signs and benches? Does the City of Morris support and have the done a resolution? Are they providing any in kind support.	- UMM Morris West Central Research and Outreach Center - Wildlife Restoration- Pollinators - Budget includes \$236,000 for shelters/kiosks/signs/benches and solar powered lights for roughly 1/2 mile trail - Budget includes \$5,000 for conference
118	103-C	5		63	Online Modules Build Local Capacity to Protect Groundwater	\$335,000	This series of 8-10 online modules will increase knowledge and skills in local government staff and leaders so that Minnesota's groundwater is protected from overuse and pollution.	Minnesota Department of Health	Raber, Carrie	What is status of pending funds?	

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119	106-C	5		60	YES! Students Take on Minnesota Water Quality Challenge	\$213,700	Youth Energy Summit (YES!) expands its successful model to improve local waterways by mobilizing over 20 youth-led teams in Minnesota communities to complete water quality related projects, monitoring and reporting.	Prairie Woods Environmental Learning Center	Foster, Shelli-Kae		- Budget includes \$10,000 for Project Seed Funds which allows for teams to purchase materials and services necessary to initiate projects for water quality and conservation related projects, events, monitoring, testing and reporting. \$500/team x 10 teams = \$5,000 x 2 years = \$10,000 - M.L. 2016, Subd. 05c "Youth-Led Sustainability Projects in 50 Minnesota Communities - Phase III", \$400,000, thru 6/30/2018 - M.L. 2014, Subd. 09b "Youth-led Sustainability Initiatives in 40 Greater Minnesota Communities", \$350,000, completed 6/30/2016 - M.L. 2011, Subd. 08a "Youth-Led Renewable Energy and Energy Conservation in West and Southwest Minnesota", \$246,000, completed 6/30/2014
120	120-C	5		49	Expanding Nature Knowledge and Experience in North Minneapolis	\$865,000	Compelling, new, interactive exhibits at North Mississippi Regional Park will spark curiosity, increase knowledge, change behavior, and inspire a diverse audience of 326,000 annual visitors to explore the outdoors.	Minneapolis Park & Recreation Board	Pulscher, MaryLynn	- Is this an all or nothing project? If for some reason project didn't receive all of desired funding, could they still move forward updating some exhibits? - Need correct budget info. What is status of pending funds. Is this just for North Mpls residents or is North in the title because North Mississippi Regional Park is located in M Mpls - misleading title. How many visitors currently use this park and how many from North Mpls vs rest of Mpls vs Brooklyns?	- Budget includes \$15,000 for outdoor equipment - Proposal budget is Inconsistent with proposal sheet budget Activity 1 Proposal Budget is \$1,077,000 Activity 1 includes the in-kind funds so should be \$865,000
121	126-C	5		45	Dangerous Plant Guides: How to Recognize and React	\$138,380	There is a growing need to provide outreach materials on dangerous plants to residents who enjoy the outdoors. This project will develop videos, brochures, and posters for statewide distribution.	Minnesota Department of Agriculture	Justen, Emilie	Does state have dangerous plant list and how does it currently provide info?	
122	100-C	4		65	Providing Enduring Ecology Experiences for All Minnesota Middle-schoolers	\$308,000	Cedar Creek will use local scientific data in a freely-available, interactive web-based learning application and virtual field trip to teach ecology and environmental awareness to Minnesota's 200,000 middle school students.	U of MN	Potter, Caitlin	Like the idea of web based learning application but would prefer \$\$ mot going to private contracts. Why not use MN students for game design and video production?	- Cedar Creek Ecosystem Science Reserve-UMN - 2 private contracts for \$245,000 to Andamio Games and Brown & Company for game design and video production - What is the relationship with the "Integrating Environmental Science Research in High School Education" proposal? See proposal 0114-C
123	104-C	4		61	The SAFL Summer Experience	\$158,069	This project provides an annual interactive STEM experience for students and teachers at the St. Anthony Falls Laboratory, a world-renowned research facility in downtown Minneapolis along the Mississippi River.	U of MN	Heitkamp, Barbara		- St. Anthony Falls Laboratory-UMN
124	110-C	4		58	Unlocking the Science of Minnesota's Moose Decline	\$300,000	The Minnesota Zoo will develop educational displays and engaging, hands-on components to summarize scientific findings about moose decline in Minnesota. Information will be integrated online to increase accessibility for all.	Minnesota Zoological Garden	Mattson, Nicole	Should ask for arts & cultural dollars for sculpture	- Budget includes \$70,500 for audio system - Budget includes \$12,000 for touchable artifacts - Budget includes \$40,000 for bronze moose calf sculpture

Line #	ID #	Member Ranking	Member Conflict	Staff Ranking	Project Title	\$ Requested	Project Summary	Organization	Project Manager	Member Notes	Staff Notes
125	119-C	4		49	Minnesota River Water Quality Education	\$65,000	This project targets Environmental Education and will provide a water quality education, field trips, monitoring and assessment to a total of 3,000 students in Southwestern Minnesota.	Minnesota State University - Mankato	Ceurvorst, Robyn		- See 113-C "Minnesota River Education Model: Connecting Students to Watersheds" and 121-C "River Watch on the Minnesota River" for similar proposal
126	107-C	3		60	Blue Thumb Pollinator Plantings Connecting Regional Population Centers	\$321,034	Deploying Blue Thumb - Planting for Clean Water® resources to regional population centers to connect pollinator corridors, improve water quality, and to inventory and map matrix of privately managed native plantings.	Metro Blooms	Scholl, Laura		- Budget includes \$12,300 for exhibit materials
127	113-C	3		53	Minnesota River Education Model: Connecting Students to Watersheds	\$248,582	An educational model that delivers watershed stewardship education to 2,000 high school students in St. Peter, Mankato, and New Ulm, using science to promote an action-based conservation ethic.	Minnesota State University- Mankato	Musser, Kimberly		- Water Resources Center - See 119-C "Minnesota River Water Quality Education" and 121-C "River Watch on the Minnesota River" for similar proposal - Budget includes \$10,260 for printing materials - Budget includes \$3,000 for drone and camera
128	128-C	3		41	Farm Based Environmental Education: Studies Measuring Altered Hydrology	\$206,199	Create educational opportunities for emerging environmental scientists by providing living laboratories with numerous practices/structures/systems at one site demonstrating how to manage and measure altered hydrology on a working farm.	Cannon River Watershed Partnership	Kraus, Alan		- Budget includes \$32,400 for Farm Site Owner: management duties - Budget includes \$21,100 for bio-reactor - Budget includes \$14,132 for saturated buffer - Did not follow instructions-2 pages of proposal removed - Budget includes \$50,625 for Executive Director-not an allowable expense
129	130-C	3		34	Aquatic Education & Outreach Programs: Engaging 6,000 Students	\$52,477	The Aquatic Research & Conservation Society requests funding to expand youth learning experiences enhancing their environmental science education through hands-on field and in-class workshops and free classroom kits to educators.	Aquatic Research & Conservation Society, Inc.	Waters, Amy		

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130	105-C	1		60	Engaging a Diverse Public in Ecological Restoration	\$383,600	Great River Greening will make 5,300 restoration volunteer high-quality contacts through a myriad of offerings and levels of engagement, targeting a younger, more diverse audience.	Great River Greening	Buck, Wiley		<ul style="list-style-type: none"> - Budget includes \$20,000 for Nature Centers (4) for Schools for Pollinators - Budget includes \$36,000 for travel - Budget includes \$32,000 for Volunteer Event expenses - M.L. 2017, Subd. 08i "Community Stewardship to Restore Urban Natural Resources - Phase Ten", \$524,000, thru 6/30/2020 - M.L. 2016, Subd. 08g "Upland, Wetland, and Shoreline Restoration in Greater Metropolitan Area", \$509,000, thru 6/30/2019 - M.L. 2015, Subd. 08f "Metro Conservation Corridors Phase VIII - Enhancing Restoration Techniques for Improved Climate Resilience and Pollinator Conservation", \$400,000, thru 6/30/2018 - M.L. 2014, Subd. 06f "Upland and Shoreline Restoration in Greater Metropolitan Area", \$300,00, completed 6/30/2017 - M.L. 2013, Subd. 04d2.3 "MECC VII - 2.3: Restoring Our Lands and Water", \$208,000, completed 6/30/2016 - M.L. 2011, Subd. 04i2.3 "MECC VI - Restoring our Lands and Waters", \$400,000, completed 6/30/2015
131	122-C	1		48	Online Training for Front Line Water Quality Protectors	\$322,175	This project will construct an online training course for county and state staff enabling them to prevent the incidence of manure and or nutrients from entering surface and ground water.	U of MN	Art, Timothy		<ul style="list-style-type: none"> - Budget includes \$50,000 for videography, video editing and narration for curriculum
132	125-C	1		46	RAPID: Google for the Environment	\$228,000	We will develop RAPID, the Environmental Google, to help maintain the lowest levels of chemicals in the environment, and to be used by government agencies, science teachers, researchers, and citizens.	U of MN	Wackett, Lawrence		<ul style="list-style-type: none"> - Budget includes \$15,000 for commercial software
133	129-C	1		35	Managing Soil Quality for Ecosystem Services & Productivity	\$1,451,404	Developing an innovative approach to reduce water quality impacts from agricultural landscapes by focusing on soil health management, rather than yield, resulting in increased ecosystem services and crop quality.	Rural Advantage	Meschke, Linda		<ul style="list-style-type: none"> - 5 year project - Budget includes \$642,600 for contracts - Budget includes \$500,000 for in-field implementation costs. - Budget includes \$268,389 for Executive Director-not an allowable expense
134	131-C	1		28	Native Plant Education/Implementation Benefitting Pollinators and Water	\$224,900	RCD will educate diverse kindergarten-adult audiences about how native plants are essential for protecting pollinators and water. RCD will assist residents with native plantings and provide matching grant incentives.	Ramsey Conservation District	WhiteEagle, Ann		<ul style="list-style-type: none"> - Budget includes \$77,400 for puppet shows - Budget includes \$35,000 for matching grant incentives for native plantings for residents - Budget includes \$15,000 for printing educational materials also cookies/beverages - Budget is not clear and does not align with proposal
135	117-C	0		51	Digital Watershed Simulator for K-12 Education and Outreach	\$314,489	We will use a cutting-edge visualization platform to turn water resource education into intuitive, hands-on, informal, and play-based learning experience for K-12 students and communities in Minnesota.	St. Cloud State University	Liu, Zengqiang		<ul style="list-style-type: none"> - Budget includes \$84,000 to build simulators (requires PC, projector, sensor for each simulator)

Line #	ID #	Member Ranking	Member Conflict	Staff Ranking	Project Title	\$ Requested	Project Summary	Organization	Project Manager	Member Notes	Staff Notes
136	123-C	0		48	Customized Water Education Combining Stories, Histories, and Science	\$427,215	The Humanities Center will work with 160 locally-based organizations in 8 Minnesota communities to develop community-specific activities, events, and exhibits that educate 8,000 Minnesotans about water in Minnesota.	Minnesota Humanities Center	Tonko, Jennifer	What are grants for - to host mtgs?	- Budget includes grants for host communities at \$80,000 (8x\$10,000) it is unclear what these grants are for
137	124-C	0		47	Market Science: Connecting Minnesotans with Environmental Research	\$236,165	Market Science is a scientific education and outreach program that promotes dialogue between Minnesota's scientist and citizens through attractive visual displays and interactive demonstrations at Farmer's markets and county fairs.	U of MN	Tiffin, Peter		- Budget includes \$3,000 for space rental at Minnesota fairs and markets - Budget includes \$6,000 to development displays
138	D. Aquatic and Terrestrial Invasive Species (25 Proposals/Subtotal \$31,581,850)										
139	132-D	14		74	Minnesota Invasive Terrestrial Plants and Pests Center 4	\$7,000,000	Funding is requested to accelerate high priority research that will protect Minnesota's wetlands, forests, prairies, and agricultural resources from terrestrial invasive plants, pests, and pathogens.	U of MN	Venette, Robert	What promise can they show in winning this battle? How could it truly help?	- Continuation - Terrestrial invasive species research - M.L. 2016, Subd. 06a "Minnesota Invasive Terrestrial Plants and Pests Center - Phase III", \$3,750,000, thru 2023 - M.L. 2015, Subd. 06a "Minnesota Invasive Terrestrial Plants and Pests Center", \$5,000,000, thru 6/30/2023 - M.L. 2014, Sec. 8 "Invasive Terrestrial Plants and Pests Center", \$1,460,000, thru 6/30/2022
140	139-D	10		69	Determining Minnesota's Risk of a Toxic Algal Invader	\$243,000	This project will determine the historical distribution, abundance, and toxicity of the invasive blue-green alga, <i>Cylindrospermopsis raciborskii</i> , in Minnesota lakes using a combination of paleolimnological and contemporary monitoring techniques.	Science Museum of Minnesota	Heathcote, Adam	Are there other known invasive	- St. Croix Watershed Research Station - AIS: blue-green algae - M.L. 2016, Subd. 04a "Tracking and Preventing Harmful Algal Blooms", \$500,000, thru 6/30/2019 - M.L. 2015 Emerging Issues "Tracking and Preventing Harmful Algal Blooms", \$93,000 completed
141	141-D	10		64	Palmer Amaranth Detection and Eradication	\$431,200	Find and control Palmer amaranth in conservation plantings to prevent severe economic damage and protect prairies.	Minnesota Department of Agriculture	Chandler, Monika	- We need policy changes to require seed supplier to pay the costs and/or be insured against the costs. - What did legislature appropriate to MDA for PA in 2017? How does this relate to that funding and earlier LCCMR funding? - How does this match and work with the legislative funding they also received? Don't maybe need now.	- Continuation of emerging issues allocation - LCCMR Emerging Issues Account award \$173,000 on 6/21/2017 thru 6/30/2018 - TIS-Palmer amaranth (plant) - M.L. 2016, Subd. 06e "Elimination of Target Invasive Plants - Phase 2", \$750,000, thru 6/30/2019 - M.L. 2013, Subd. 06d "Elimination of Target Invasive Plants", \$350,000, completed 6/30/2016
142	133-D	9		73	Developing RNA Interference Genetic Controls for Zebra Mussels	\$769,528	We will develop a micro particle using genetics (RNA interference) to specifically control zebra mussels.	U.S. Geological Survey	Merkes, Christopher	Is project location in WI?	- Upper Midwest Environmental Sciences Center - USGS LaCrosse - AIS: Zebra Mussels - Mike McCarty UMN Minnesota Aquatic Invasive Species Research Center receiving \$15,000
143	152-D	9		50	Evaluate Control Methods for Invasive Hybrid Cattails	\$131,920	This project will evaluate the effectiveness of two methods to remove exotic hybrid cattail to restore fish and wildlife habitat in Minnesota wetlands.	Voyageurs National Park	Windels, Steve	Kansas should fund Kansas State Staff & Students. Project should use MN State Staff & provide opportunities for MN Students.	- AIS: Hybrid Cattails - Budget includes \$46,460 for Kansas State Staff - Budget includes \$11,480 for Kansas State students - Budget includes \$8,000 for flight time for aerial muskrat and vegetation surveys - Budget includes \$2,000 for publication costs

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144	134-D	8		73	An Effective and Practical Invasive Carp Deterrent	\$998,000	Promising new carp deterrent system is tested in the Mississippi River along with an existing deterrent and predators; 99% blockage is suggested and Fish and Wildlife Service is a partner.	U of MN	Sorensen, Peter	Is this project and 136D working together?	- Continuation - AIS: Invasive Carp - Budget includes \$340,000 for 2 yr. lease for speaker system (with option to buy) - Budget includes \$10,000 for shipping FGS speak system from UK - M.L. 2014, Subd. 04a "Blocking Bighead, Silver and Other Invasive Carp by Optimizing Lock and Dams", \$854,000, completed 6/30/2017 - M.L. 2013, Subd. 06a "Attracting carp so their presence can be accurately assessed", \$682,969, thru 6/30/2019 - M.L. 2012, Sec. 3 "Aquatic Invasive Species (AIS) Cooperative Research Center; Appropriation", \$2,000,000, thru 6/30/2018
145	135-D	8		72	Slow the Spread of the Emerald Ash Borer	\$14,689,500	Reducing the yearly rate of spread of the emerald ash borer through outreach and strategic management grants could delay spread throughout Minnesota for decades and save billions of dollars.	Minnesota Department of Agriculture	Abrahamson, Mark	- How does this relate to 2017 project? Did LSOHC fund? How will they decide which communities to work with? What is MDA currently doing to educate people about EAB? Is MDA currently helping communities combat EAB? Is MN Nursery & Landscape Assn involved? - Expensive and not reasonable to use this amount of trust fund money on this. May lose the battle in the end anyways and departments should already be doing this and receive funding to do this. What are they doing with those funds.	- Similar or identical to LSOHC proposal "Slow the Spread of the Emerald Ash Borer" for \$14,689,500 - Continuation - TIS: Emerald Ash Borer (EAB) - M.L. 2017, Subd. 06b "Emerald Ash Borer Biocontrol - Phase III", \$729,000, thru 6/30/2020
146	138-D	7		70	Monitoring and Biocontrol of Brown Marmorated Stink Bug	\$199,224	Brown marmorated stink bug is increasing in Minnesota. This project will expand monitoring to identify areas of spread, and gather data on native parasitoids and predators and implement biological control.	Minnesota Department of Agriculture	Ambourn, Angie	How does this related to earlier projects? What did 2014 project show and status of 2015 project?	- Continuation - TIS Research: Brown marmorated stink bug - M.L. 2014, Subd. 04f, "Brown Marmorated Stinkbug Monitoring and Biological Control Evaluation", \$266,000, completed 6/30/2017 - 2015 UMN Minnesota Terrestrial Invasive Plants and Pests Center "Early Detection, Forecasting and Management of the brown marmorated stink bug, Halyomorpha halys", \$597,795
147	136-D	5		71	Sound Gradient for Acoustic Deterrence of Bigheaded Carp	\$396,310	Develop a sound gradient acoustic barrier for deployment in locks. As invasive carp swim upstream, they will encounter ever increasing, louder sound and be forced to turn back downstream	U of MN - Duluth	Mensingher, Allen	- What did 2014 project show? - Maybe, but how does this work with Dr. Sorenson's project? Should work together, if funded.	- Continuation - AIS: Invasive Carp - Budget includes \$57,000 for sound projections @ 12 units - Budget includes \$30,909 for travel including to LaCrosse, WI; Morris, IL and Havanna, IL - M.L. 2014, Subd. 04b "Bioacoustics to Detect, Deter and Eliminate Silver Carp", \$262,000, completed 6/30/2017
148	142-D	5		61	Using CO2 to Kill Undesirable Fish Including Carp	\$470,000	We will develop techniques to for controlling nuisance and invasive fish species. Adding CO2 under ice is effective and inexpensive with great potential to improve water quality and aquatic habitat.	U of MN	Cotner, James	Very interesting. Can they target only some fish or do all get killed?	- AIS: Common carp
149	146-D	5		57	New Tools for Fight Against Zebra Mussels	\$539,323	We will validate, develop manuals and train people on the use of both a portable DNA detector and commercially available mapping technology for integration into their Zebra Mussel monitoring program.	U.S. Geological Survey	Amberg, Jon	Can they really kill and rid us of them, or is it just good money down the drain, as we've maybe lost the fight.	- Upper Midwest Environmental Sciences Center - LaCrosse - AIS- Zebra Mussel detection tool development - Budget includes \$50,000 for Handheld Detectors

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150	147-D	5		57	Terrestrial Invasive Plant Detection Methods for Forest Lands	\$300,000	Develop and test aerial buckthorn detection methods in northern Minnesota; upgrade invasive plant risk model to prioritize forest surveys; design/test ground survey methods and integrate into annual work planning.	MN DNR	Burks, Susan		- TIS Plant detection methods: Buckthorn
151	137-D	4		71	Fish on a Chip: An AIS Detection Platform	\$399,000	In this study we will develop and validate a new method for simultaneously determining the presence and relative quantity of 21 invasive fish species in any Minnesota waterway.	U of MN	Sadowsky, Michael	Make sure muskie are properly identified as invasive species too.	- AIS Research - Budget includes publication costs \$5,000
152	140-D	4		66	Stopping Invasive Species By Attacking From Below	\$491,515	Invasive plants strongly impact soil microbes, fungi, and fertility; we will evaluate innovative and potentially effective methods to manipulate these soil properties to control invasive plants in prairies and forests.	U of MN	Tiffin, Peter	Can we really stop invasive plants this way?	- TIS-Invasive plants: buckthorn and vetch
153	148-D	4		56	Integrating Control of Zebra Mussels and Aquatic Vegetation	\$251,310	The project investigates the use of aquatic pesticides for combined control of zebra mussels and nuisance aquatic vegetation by identifying efficacious pesticides to mussels and sites of nuisance species co-occurrence.	U.S. Geological Survey	Waller, Diane		- Upper Midwest Environmental Sciences Center - USGS LaCrosse - AIS: Zebra Mussels - Staff are checking if the AIS Center previously funded similar or identical work - Budget includes \$40,000 for Minnesota Aquatic Invasive Species Research Center - Budget includes \$211,310 for USGS staff - M.L. 2013, Subd. 06f "Zebra Mussel Control Research and Evaluation in Minnesota Waters", \$600,000, completed 6/30/2016
154	149-D	3		55	Testing a New Method for Eradicating Dwarf Mistletoe	\$352,000	This projects seeks to use new technology that gives natural resource managers another tool to maintain healthy and productive black spruce forests across Minnesota.	U of MN	Russell, Matthew		- TIS - Unclear project length, discrepancy in timeline dates - Budget includes \$1,000 for conference costs
155	153-D	3	1	44	Circle Lake Wild Rice Restoration and Carp Management	\$594,985	The Circle Lake Wild Rice Restoration and Carp Management Project will Provide a mechanism to restore wild rice to Circle Lake to increase waterfowl abundance and diversity and, Mitigate the negative effects of carp on water quality and fishery habitat Serve as a model for other lakes within	Rice Soil and Water Conservation District	Pahs, Steven		- AIS: Common Carp - Appears to be buying a boat - Hiring a consultant to do carp removal - Budget includes \$24,000 for seine net - Budget includes \$20,000 for stormwater pond barrier supplies
156	155-D	3		35	Controlling Densities of Zebra Mussels in Infested Lakes	\$428,864	We will determine the metapopulation structure of zebra mussels within lakes, figure out source populations, and chemically treat those to reduce densities and overall impacts in whole lakes.	Limnopro Aquatic Science, Inc.	McEwen, Daniel		-AIS: Zebra Mussels -Project Manager is owner of Limnopro Aquatic Science

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157	156-D	3		33	Minnesota Traditions Newspaper AIS Awareness Campaign	\$230,000	This project seeks to educate the outdoor enthusiast about the Clean, Drain, Dry prevention techniques by delivering positive legacy messaging through a Twin Cities/North Central newspaper insert.	Mississippi Headwaters Board	Terrill, Tim	Does this use funds to create a private company?	- AIS Education - Budget includes \$203,000 for a media creation company
158	143-D	2		61	Innovative and Ecological Coatings to Mitigate Invasive Species	\$321,500	We propose to develop innovative coatings containing a revolutionary antifouling biological molecule: these coatings will contribute to coastal economy competitiveness and to mitigate the spread of invasive species.	U of MN	Elias, Mikael		- AIS
159	144-D	2		61	Accelerated Watershed Approach to Invasive Carp Management	\$342,796	This project will take an accelerated watershed approach to invasive carp management that tests new, innovative techniques and ultimately restores and protects multiple, connected waterbodies within an important chain-of-lakes system.	Prior Lake-Spring Lake Watershed District	Karschnia, Maggie	Local group is good.	- AIS: Invasive Carp - Budget includes \$91,000 for Commercial fisherman and seine nets - Budget includes \$18,000 for electrofishing boat rentals - Budget includes \$15,000 for Underwater, mobile speaker systems
160	154-D	2		44	Invasive Species Wash Site Innovation, Improvements, and Standards	\$908,023	Design and construction of innovative site improvements at five DNR offices for staff to clean equipment and contain invasive species so that they will not spread.	MN DNR	Peterson, Jason	- How many wash sites does DNR currently have? - No way! Outrageous price. The DNR should already and better be doing this now or they should be removed from all invasive species management.	- 5 Wash Sites @ \$141,000 per site for construction - Budget includes \$14,023 proposed for DNR Direct & Necessary expenses
161	150-D	1		53	Development of Predictive Tools for AIS Management	\$331,644	We will develop predictive modeling on which lakes are most susceptible to zebra mussel spread, which invasive species are most likely to arrive in Minnesota lakes and through which pathways.	Concordia College	Marko, Michelle		-AIS: Zebra Mussels -AIS modeling, tool and database development - Staff are checking if the AIS Center previously funded similar or identical work - MAISRC Sub-Project 13: Eco-epidemiological Model to Assess Aquatic Invasive Species Management, \$215,000, thru 6/30/2019 - Aquatic Invasive Species Research Center Sub-Project #11-2: Reducing and controlling AIS: Risk analysis to identify AIS control priorities and methods – Phase 2: Risk Analysis, \$139,970, thru 6/30/2019 - MAISRC Sub-Project #9: Population genomics of zebra mussel spread pathways, genome sequencing and analysis to select target genes and strategies for genetic biocontrol. \$427,950, thru 6/30/2019 - Budget includes \$52,000 for University of California, Santa Barbara - Budget includes \$48,000 for private contractor retired from USFWS - Budget includes \$20,000 for computer server with 10TB data storage - Budget includes \$4,200 for travel to Concordia from California - Budget includes \$2,500 for publication costs

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162	145-D	0		58	River Food Webs With and Without Invasive Carp	\$495,000	This project will determine how Invasive Carp disrupt river food webs, effects of disruptions on important fishes and recommend best management practices to limit harm to over 500 river miles	MN DNR	Dieterman, Doug	DNR doesn't need more money.	- AIS: Invasive carp - Budget includes \$200,000 for researcher from Iowa State University - Budget includes \$162,000 for researcher from South Dakota State University - Budget includes \$8,862 proposed for DNR Direct & Necessary expenses - M.L. 2017, Subd. 06c "Invasive Bighead and Silver Carp and Native Fish Evaluation-Phase II", \$500,000, thru 6/30/2020
163	151-D	0		52	Boot Brush Use to Prevent Spreading Invasive Species	\$267,208	A better understanding of Minnesota hikers and the tools they use to clean their gear will prevent the spread of terrestrial invasive species and protect natural and scenic resources.	MN DNR	Burks, Susan		- TIS: Mitigation Research and Education - Budget includes \$30,000 for 20 boot brush kiosks - Budget includes \$2,000 for conference - Budget includes \$3,567 proposed for DNR Direct & Necessary expenses - Ineligible expenses refreshments \$300
164	E. Air Quality, Climate Change, and Renewable Energy (20 Proposals/Subtotal \$13,974,044)										
165	158-E	9		63	Clean Electricity from Solar Windows	\$458,494	Solar windows are a disruptive photovoltaic technology that virtually invisibly integrates with buildings. This renewable energy technology will increase photovoltaics adoption, reduce air pollution, and ameliorate climate change.	U of MN	Kortshagen, Uwe	Excited about the potential to see this technology on the scale of a realistic sized window. Do have questions about the expected efficiencies and lifetime of the technology. Could have huge potential when you think about the square footage of windows in our building stock.	- Nanometer-sized silicon crystals are patented by UMN - Budget includes \$40,000 for custom build equipment
166	159-E	9		62	Community-Scale Energy Storage Guide for Renewable Energy	\$625,478	Create user-friendly, research-based energy storage guide and decision tools (print and web-based) for community-scale sites with renewable energy and do three geographically dispersed battery storage demonstration projects, through broad stakeholder-expert engagement.	U of MN	Anderson, Ellen	- Perhaps the biggest emerging issue that could change the power industry - The electric grid is changing/modernizing. Lots of folks have their minds on renewables and the next step will be storage - a guide will be necessary to navigate this emerging field. ETL does an excellent job of bringing together stakeholders from throughout the field. - Has failed multiple times-time to move on to other project priorities.	- Resubmitted 2017 proposal - Budget includes \$300,000 for Energy Storage Systems as demonstration projects (3) - Budget includes \$3,040 for ineligible office supplies
167	166-E	9		43	Life Cycle Analysis of Anaerobic Digestion and Organics	\$250,000	A life-cycle analysis (LCA) of anaerobic digestion (AD) will evaluate the use of organic materials to create clean energy, conserve resources and reduce the amount of organics going to landfills.	Minnesota Pollution Control Agency	Walsh, Kayla		- Budget is \$250,000 for a RFP to conduct Life Cycle Assessment - Unclear whether project length is 2 or 3 years
168	157-E	6		72	Agricultural Weed Control Using Robots	\$600,000	A robot, powered by solar energy, will be developed to control weeds on agricultural lands. We envision significant reductions in fossil-fuel and herbicide use while increasing local energy production.	University of Minnesota - Morris	Reese, Michael		- Resubmitted 2017 Proposal

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169	160-E	5		59	Cheap Solar Energy from Roll-to-Roll Manufacturing	\$388,852	This project is to develop cheap clean solar energy by simple roll-to-roll manufacturing. Perovskite is a new photovoltaic material, very economical while maintaining high power conversion efficiency.	U of MN	Cui, Tianhong	Time to do this. Shows promise.	- Resubmitted 2017 Proposal
170	173-E	5		33	Diverting Prepared Food from Landfills, Reducing Greenhouse Gases	\$478,000	This project will help us introduce a Prepared Foods Donation Program, which will source food donations from restaurants and prevent food from going to landfills; thereby reducing greenhouse gas emissions.	Second Harvest Heartland	Chatmas, Bob	Unsure of claim. Reduce this level of funding, if we fund. Seems expensive. Sort of a stretch to meet Trust fund mission, although a novel idea! Maybe should be funded elsewhere or privately for this.	- Budget includes \$100,000 for 2 specialized vans - Budget includes \$38,000 for annual van operating cost
171	164-E	4		46	Phase II- Reduce Solid Waste and Greenhouse Gas Emissions	\$1,151,931	This project will: expand strategies of the 2015 LCCMR grant; establish deconstruction and building material reuse as a practice statewide; document the environmental, health, and economic benefits of material reuse.	The NetWork for Better Futures (D/B/A) Better Futures Minnesota	Swaggert, Nick	Does seem too expensive, so cut down the budget, but interesting concept they work with to save good materials for buildings.	- Continuation - How does this relate to the proposal "Preserve Resources by Expanding the State's Reuse Sectors"? See proposal 108-C - Budget includes \$200,000 to provide financial incentives for municipalities in 3 counties - M.L. 2015, Subd. 07c "Building Deconstruction to Reduce Greenhouse Gas Emissions and Solid Waste", \$1,000,000, thru 6/30/2018
172	169-E	4		37	Bringing Geothermal Power to MN: CO2 Power-system Test	\$315,250	Project will design, fabricate and test an innovative, closed-cycle CO2 power system, the first steps for geothermal power and grid-scale geologic energy storage to become renewable energy opportunities for MN.	TerraCOH Inc.	Randolph, Jimmy	- Is this a private company? - Innovative, affordable. Private company could bring royalties back to Trust Fund-Need some success stories like that.	- Continuation - How does this relate to the proposal "Field testing/demonstration of novel ground source heat pump"? See proposal 165-E - Holds patented technology already - Budget includes \$12,000 for facility rental - Budget includes \$8,000 for system installation - Budget includes \$75,000 for power system - M.L. 2014, Subd. 08b "Innovative Groundwater-Enhanced Geothermal Heat Pump Study", \$1,000,000, thru 6/30/2017
173	161-E	3		55	Cheap Efficient Air Filter to Remove Organic Compounds	\$386,187	This project is to develop a new air filter to remove airborne organic compounds, polycyclic aromatic hydrocarbons. The technology is very low-cost and highly efficient to improve Minnesota air quality.	U of MN	Cui, Tianhong		
174	170-E	3		37	Color-Change Solar Coating for Residential Energy Savings	\$151,306	In this study, lab and field tests assess residential building heating and cooling cost savings by using color-changing exterior coatings, possibly yielding millions of dollars in savings for Minnesota consumers.	St. Cloud State University	Sinko, John		- Budget includes \$30,000 for Near-infrared spectrometer
175	174-E	3		32	Production and Utilization of Biomass: St. Louis County	\$3,999,300	This project will facilitate the production and utilization of biomass as a source of energy while providing economic and environmental benefits to the citizens and industry of St. Louis County.	St. Louis County Land and Minerals Department	Weber, Mark	We just allowed the shut-down of the Hibbing biomass energy plant. Have to cut our losses. Don't fund.	- Budget includes \$1,337,7000 for LiDAR and DEM datasets for St. Louis County - Budget includes \$1,736,500 for equipment: - \$120,000 for Seedlings - \$690,000 for insulated buildings (Cook and Ely) - \$74,000 for pellet bins (2) - \$740,000 for 5 million BTU boilers (2) - \$81,600 for 5% contingency

Line #	ID #	Member Ranking	Member Conflict	Staff Ranking	Project Title	\$ Requested	Project Summary	Organization	Project Manager	Member Notes	Staff Notes
176	162-E	2		54	Lowering Costs of Solar Energy in Minnesota	\$410,692	This project will reduce the cost of PV solar projects in Minnesota by creating structural design methodologies to improve the accuracy of load estimation for both wind and snow loading.	U of MN	Marr, Jeffrey	May consider, but what can they really do to bring solar costs down?	- St. Anthony Falls Laboratory-UMN - Budget includes \$10,000 for sensor system
177	165-E	2		45	Field Testing/demonstration of Novel Ground Source Heat Pump	\$174,757	Project will field-test novel ground source heat pump technology developed at the UMN. Promising research must now be followed by pre-commercial testing, paving the way for a MN heat pump renaissance.	U of MN	Randolph, Jimmy	Affordable research, with good promise if they can achieve this. Practical.	- Continuation - How does this relate to the proposal "Bringing Geothermal Power to MN: CO2 Power-system Test"? See proposal 169-E - Intellectual Property Disclosure already filed - Budget includes \$75,945 for Braun Intertec - M.L. 2014, Subd. 08b "Innovative Groundwater-Enhanced Geothermal Heat Pump Study", \$1,000,000, thru 6/30/2017
178	176-E	2		27	Keeping Groceries from Landfills to Reduce Greenhouse Gases	\$848,000	This project will help our food bank expand efforts to gain donations of food from grocery retailers, preventing this food from going to landfills, and thereby reducing greenhouse gas emissions.	Second Harvest Heartland	Chatmas, Bob	Another stretch of Trust fund mission. Too costly, although a novel idea. Shouldn't need LCCMR funds to do this.	- Budget includes \$470,000 for 2 trucks with refrigerated trailers
179	167-E	1		40	Electrically Switchable Adsorption of PAHs on Renewable Cellulosic Nano Carbon Materials for Mitigation of Airborne Pollutants	\$202,000	A unique nano carbon materials from cellulosic fibers will be examined for adsorption of PAHs, providing an efficient means for mitigation of airborne contaminants at sites of emission.	U of MN	Wang, Ping		
180	171-E	1		34	Capacity Building for Rural Resource Management Implementation	\$655,424	We will implement a community engagement strategy that will enable state agencies to better implement natural resource management strategies in rural areas with authentic rural support for those strategies.	Institute for Agriculture and Trade Policy	Claussen, Anna		- Budget includes \$180,000 for Jefferson Center - Budget includes \$21,500 for Rural Development consultant - Budget includes \$30,000 for Office Space - Budget includes \$5,000 for printing/copying - Budget includes \$5,200 for computers/internet/phones - Budget includes \$15,000 for space rental - Budget includes \$90,000 for stipend for participants
181	172-E	1		34	Developing Innovative Mercury Capture Technology for Crematoria Emissions	\$435,984	The proposal project develops affordable and easy to use technology to capture mercury in crematoria emissions. This prevents contamination of our water resources, impacting the food chain and human health.	U of MN	Myers, Sandra		- Budget includes \$17,429 for Atomic absorption mercury analyzer - Budget includes publication costs \$1,8000
182	175-E	1		30	Stove Swap: Improving Air and Health; Avoiding Violations	\$1,008,389	Stove Swap incentivizes replacement of inefficient wood burning devices, provides cleaner burning options, helps meet air quality standards by reducing 43 tons/yr. of emissions, and improves our health and economy.	Environmental Initiative	Droessler, William	Too expensive	- 320 wood heater replacements planned - Budget includes \$880,000 for 320 change outs (\$2,750 per change out)
183	163-E	0		49	A Solar-Powered Electrochemical System for Sulfide Removal	\$435,000	This project will develop a solar-powered electrochemical system to be applied to remove major odorous sulfide compounds in sewage and to remove sulfur from acid mine drainage.	U of MN	Hu, Bo		- Continuation - Still awaiting results of previous work - Budget includes \$10,000 to build pilot scale device - Budget includes publication costs \$3,000 - M.L. 2014, Subd. 08g "Next Generation Large-Scale Septic Tank Systems", \$258,000, completed 6/30/2017

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184	168-E	0		39	Optimizing Food Waste Reduction Throughout Minnesota	\$999,000	This project will develop tools to optimize food waste reduction in specific contexts (size of cities, location, etc.) throughout Minnesota, reducing environmental impacts while gaining economic benefits.	U of MN	Baker, Lawrence	Too expensive	- Budget includes publication costs \$3,000 - Budget includes in-state conferences costs \$1,800 - Budget includes \$19,654 for 6-month truck rental + mileage
185	F. Methods to Protect or Restore Land, Water, and Habitat (22 Proposals/Subtotal \$30,965,697)										
186	179-F	10		68	Preserving and Restoring Minnesota's Native Orchids – Phase 2	\$468,000	Minnesota's 48 native orchids are at risk. The Minnesota Landscape Arboretum will expand conservation of species through propagation and banking and begin restoration planting research in the program's second phase.	U of MN	Remucal, David	Too much money for such a little area benefitted.	- Continuation - MN Landscape Arboretum - M.L. 2015, Subd. 08c "Preserving and Protecting Minnesota Native Orchid Species", \$167,000, thru 6/30/2018
187	183-F	8		57	Sediment Hazards to Trout in Southeast Minnesota Streams	\$337,000	Excess sediment in southeast Minnesota streams can smother trout eggs. Large floods can crush them with gravel. We build knowledge to restore and improve trout populations, fishing, and habitat.	U of MN	Wickert, Andrew	Make sure it is focused on restoring fishing.	- St. Anthony Falls Laboratory-UMN - Wildlife Research: Trout - Budget includes \$3,000 for publication costs
188	184-F	8		55	Repurposing Unprofitable Cropland: Water and Wildlife's Silver Bullet?	\$319,063	Conduct the first statewide quantitative analysis estimating the extent of unprofitable croplands, and quantify the water-quality and habitat benefits of converting these lands to perennial vegetation.	Science Museum of Minnesota	Ulrich, Jason	Just another government funded study that may be used to sway the public against farmers.	- St. Croix Watershed Research Station
189	185-F	8		53	Advancing Streambank Protection Systems	\$286,426	We request funding to build and test a prototype of a new bank protection system designed to protect stream banks, limit erosion and provide electricity in pristine ecosystems.	U of MN	Guala, Michele	Sounds interesting to develop a new bank protection method.	- St. Anthony Falls laboratory-UMN - Secured provisional patent already - Budget includes prototype components for \$30,000
190	178-F	7		69	Nongame Wildlife Program Acceleration	\$2,000,000	This acceleration package will fulfill ENTRF goals including rare wildlife data collection and management, conservation education, collaborative land protection management, & new emphasis on nature tourism to benefit rural communities.	MN DNR	Henderson, Carrol	-This program is a Minnesota Treasure - Critically needed - Way too expensive. Better ways to use trust money.	- Budget includes \$45,622 proposed for DNR Direct & Necessary expenses
191	182-F	7		58	Restoring Minnesota's Forests in State Parks	\$432,240	Restores 420 acres of high-quality forests at Itasca, Jay Cooke, Scenic, Forestville Mystery Cave and Wild River State Parks and Greenleaf Lake State Recreation Area.	MN DNR	Quinn, Edward	- What is DNR average restoration cost? Is there an average amount for LCCMR or LSOHC projects? What is status of other pending funds? Who are services contracts with? - Maybe ok, but seems expensive for only 420 acres.	- \$1,000 per acre for restoration costs - Budget includes \$250,000 in contracts - Budget includes \$150,000 in supplies - Budget includes \$12,240 proposed for DNR Direct & Necessary expenses

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192	186-F	7		52	Restoring Wetland Invertebrates to Revive Wildlife Habitat	\$417,895	Amphipods are wetland invertebrates that are critical wildlife food and indicators of water quality. We will assess reasons they are missing from Prairie Potholes and unique methods to restore amphipods.	MN DNR	Larson, Danelle		<ul style="list-style-type: none"> - Wildlife Research: Amphipods - Stocking of amphipods - Budget includes \$10,000 for conferences - Equipment and Tools needs better breakdown for \$10,000 and \$40,000 - Budget includes \$10,000 for paper, envelopes, post cards - Budget includes \$8,000 for publication costs in open-access journals (4 @ \$2,000) - Budget includes \$10,485 proposed for DNR Direct & Necessary expenses
193	187-F	7		50	Implementing Novel Market-based Methods for Urban Habitat Restoration	\$499,900	The Implementing Novel Market-based Methods for Urban Habitat Restoration is intended to restore native habitat and evaluate methods which incentivize habitat restoration and sustainable conservation in an urban setting.	Great River Greening	Huckett, Steven	Skeptical of the "market based" claims. Don't see the real market monetary value.	<ul style="list-style-type: none"> - To restore 450 acres - Budget includes \$247,000 for seed for 415 acres - Budget includes \$2,700 for Volunteer Event supplies and rentals - M.L. 2017, Subd. 08i "Community Stewardship to Restore Urban Natural Resources - Phase Ten", \$524,000, thru 6/30/2020 - M.L. 2016, Subd. 08g "Upland, Wetland, and Shoreline Restoration in Greater Metropolitan Area", \$509,000, thru 6/30/2019
194	189-F	7		49	Increasing Timber Availability and Habitat With Soil Management	\$396,000	Develop strategies and practical tools to identify conditions that minimize impacts to soil across a wide range of conditions to promote regeneration of diverse forests, wildlife habitat, and timber availability.	U of MN	Slesak, Robert		<ul style="list-style-type: none"> - Budget includes \$25,000 for mobile soil pressure apparatus
195	190-F	6		47	Working Conservation Lands for Grazing, Harvest, and Habitat	\$315,000	The project will improve water quality, pollinator habitat, and other ecosystem services by establishing perennially-rooted crops on conservation lands for managed grazing, biomass, livestock feed, and emerging food products.	Minnesota Board of Water and Soil Resources	Rhees, Suzanne	Ok idea.	
196	194-F	6		45	MN CREP for Water Quality and Habitat	\$20,000,000	MN CREP is a federal and state partnership designed to improve water quality and provide habitat in the 54 County area through establishing buffers, restoring wetlands, and protecting groundwater resources.	Minnesota Board of Water and Soil Resources	Rickert, Dave	<ul style="list-style-type: none"> - Sign up stats needed, bonding - What is status of LSOHC request? What is status of pending funds? What is average for easement? Can't do full request amount. - Priority of the legislature to fund. Do we need all \$20M? 	<ul style="list-style-type: none"> - Similar or identical to LSOHC proposal "RIM Wetlands Phase IX" for \$20,000,000 and "RIM Buffers for Wildlife and Water Phase VII" for \$8,000,000 - Acquire Conservation Easements (402 easements; 6,594 acres) - \$14,375,400 for 6,954 acres @ \$2,180 per acre - Secured USDA Funds \$39,522,200 - 5 years to complete - Budget includes Direct Support Services \$220,000, with no information as to what the \$ go to
197	188-F	5		50	Converting Agricultural Wastes Into Energy, Polymers, and Fertilizers	\$949,000	Swine manure, sugar processing waste, and ethanol fermentation waste contain significant amounts of unused energy and nutrients. This project will revolutionize waste management by converting these waste into primary resources.	U of MN	Pagliari, Paulo	Innovative and could be tremendous future benefits to the state and environment	<ul style="list-style-type: none"> - Awaiting on results of phase I 2014 appropriation - Budget includes \$80,000 equipment for (4) reactors - Budget includes \$150,000 equipment for ammonia reactor - M.L. 2014, Subd. 08f "Clean Water and Renewable Energy from Beet Processing Wastewater and Manure", \$400,000, completed 6/30/2017

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198	196-F	5		32	Okabena Creek Water Quality and Flood Protection Demonstration	\$720,565	HLWD is partnering with agricultural landowners to create a pond and two-stage ditch, both of which would include the establishment of native prairie, pollinator habitat, and protection in perpetuity.	Heron Lake Watershed District	Voit, Jan		- Conservation easement acquisition of 12 acres @ \$6,500 per acre - Ditch restoration - 5 acre two-stage ditch and 7-acre pond - Budget includes \$10,000 for Educational outreach materials - Budget includes \$40,000 for monitoring structures (4)
199	177-F	4		72	Identifying Pollinator Conservation Areas in Minnesota Prairie Parklands	\$552,100	This research will produce an on-line, interactive map illustrating current or potential future quality of pollinator conservation areas in Minnesota by considering habitat quality, surrounding land cover, and pesticide risk.	U of MN	Lonsdorf, Eric	Too expensive! Bees in park areas are not always welcome to picnickers.	-Budget includes open-access publications \$8,000
200	180-F	3		66	Show Me the Money:10 Markets for Perennials	\$347,500	Design and evaluate 10 market-based scenarios for perennial cropping systems and their potential to improve water quality and provide wildlife habitat. Create awareness through thought-provoking videos, fact sheets, and presentations.	Science Museum of Minnesota	Schottler, Shawn	Establishing new markets with unorthodox crops is a win/win. Ongoing benefit for the state.	- St. Croix Watershed Research Station
201	181-F	3		65	Restoration Strategies for Ditched Peatland SNA Phase II	\$460,294	This project will conduct a feasibility study, and design and implement a pilot habitat restoration project resulting in the increased health and resiliency of a pattern peatland ecosystem.	MN DNR	Walker, Michele	Want to understand the real benefit better, if we fund it.	- Continuation - Budget includes \$14,294 proposed for DNR Direct & Necessary expenses - M.L. 2011 Subd. 04q "Restoration Strategies for Ditched Peatland Scientific and Natural Areas", \$200,000, completed 6/30/2015
202	191-F	3		46	Are We Turning Wild Prairie Plants Into Crops?	\$555,441	Prairie restorations use native plant seeds produced in agricultural conditions. Is this reducing plant diversity and establishment, thereby undermining restoration success? Our experimental and genetic studies will answer this question.	U of MN - Duluth	Haines, Dustin	Not a great value.	
203	193-F	3		46	Preserving Natural Shoreline on the St. Croix River	\$128,520	Preserving Natural Shoreline on the St. Croix River will provide landowners, local governments, and realtors/developers with necessary tools to protect our nationally-designated river's clean water and Wild and Scenic character.	St. Croix River Association	Warren, Natalie		- M.L. 2015, Subd. 08j "Shoreland Protection for the Lower St. Croix River", \$190,000, thru 6/30/2018 - M.L. 2011, Subd. 03o "St. Croix Basin Conservation Planning and Protection", \$175,000, completed 6/30/2014
204	198-F	3		25	Saving Our Mosquito-Eaters: Management of White-nose Syndrome	\$580,000	White-nose syndrome is drastically affecting bats throughout Minnesota, and the best means of censusing them is by using acoustics. Well use this to evaluate ways to help them.	U of MN	Marchetto, Peter		- Wildlife Research: Bats
205	195-F	2		42	Replacing Plastic Cover in Vegetable Production with BioMulch	\$310,000	A biodegradable product will be developed to replace non-degradable petroleum based plastic used in vegetable and fruit production. This project, if funded, will revolutionize horticulture in Minnesota, and potentially worldwide.	U of MN	Pagliari, Paulo	Very good project proposal. Exciting to think of how revolutionary this could be and a new market established here in MN for the world!	- Agricultural Utilization Research Institute

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206	192-F	1		46	Floating Mini-gardens for Shoreline Protection and Wetland Restoration	\$310,753	Floating mini-gardens are proposed to decrease waves crashing onto shoreline to reduce erosion, to provide habitats, and to facilitate soil accumulation to help vegetation growth for wetland restoration.	U of MN	Shen, Lian		- St. Anthony Falls Laboratory-UMN - Budget includes \$7,000 for a velocimetry tool
207	197-F	0		25	Hearing the Cry of the Loon	\$580,000	Loons might be displaced by too much noise in their mating and nesting season. Monitoring their nesting grounds will allow us to fix this.	U of MN	Marchetto, Peter		- Wildlife Research: Loons - Budget includes \$32,000 for acoustic recording/video & audio streaming/telecom/analysis computers & equipment
208	G. Land Acquisition, Habitat, and Recreation (18 Proposals/Subtotal \$40,157,964)										
209	201-G	13		70	Local Parks, Trails and Natural Area Grants	\$3,000,000	Provide approximately 25 matching grants for local parks, acquisition of locally significant natural areas and trails to connect people safely to desirable community locations and regional or state facilities.	MN DNR	Mularie, Audrey	A better use of funds compared to 200G request	- 25 Matching Grants - Budget includes \$6,907 proposed for DNR Direct & Necessary expenses - M.L. 2011, Subd. 04d "Regional Park, Trail and Connections Acquisition and Development Grants", \$2,000,000, completed 6/30/2013
210	202-G	13		70	Minnesota State Trails - Development and Enhancement	\$5,000,000	This project is to focus on expanding recreational opportunities on Minnesota's State Trails through the development of new trail segments and/or the rehabilitation, improvement and enhancement of existing State Trails.	MN DNR	Skaar, Kent		- Gateway State Trail – North St. Paul - Gitchi Gami State Trail – Tofte - Paul Bunyan State Trail – Bemidji - Gateway State Trail – St. Paul - Heartland State Trail – Cass County - Gitchi Gami State Trail – Silver Bay - Budget includes \$59,176 proposed for DNR Direct & Necessary expenses - M.L. 2017, Subd. 09d "Minnesota State Trails Acquisition, Development and Enhancement", \$1,038,000, thru 6/30/2020
211	207-G	12		55	Harmony State Trail Extension Land Acquisition	\$235,000	To acquire fee title to 16 parcels to allow for the extension of the state trail from Harmony south to the Iowa state boarder with a spur to Niagara Cave.	City of Harmony	Illg, Jerome	Is amount \$235 or \$250,000? Proposal uses both numbers	- State Trail Segment Extension - Fee Title Acquisition of 16 parcels totaling 25 acres
212	209-G	12		54	Superior Hiking Trail Enhancement Plan	\$100,200	Evaluate routing, safety, water management and other environmental and design issues of the Superior Hiking Trail and establish SHTA best practices methods for carrying out the resulting redesign plans.	Superior Hiking Trail Association	Caneff, Denny		- M.L. 1991, Subd. 03b "Superior Hiking Trail", \$400,000, completed - Past ENTRF Appropriation 1989 \$156,000 - Past ENTRF Appropriation 1987 \$380,000

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213	200-G	11		70	Minnesota State Parks and State Trails Land Acquisition	\$5,000,000	Minnesota State Parks and Trails land acquisition proposal is to acquire high priority parcels within legislatively authorized boundaries from willing sellers to protect Minnesota's environmental stewardship and enhance outdoor recreation.	MN DNR	Christie, Jennifer	This should be funded through Legacy funds and the big pot the DNR already gets for state parks funding-about 40% of the Legacy Park funds. Don't fund them hear too.	- Continuation - Fee Title Acquisition of 163 acres - Tettegouche State Park 7 acres - Sibley State Park 16 acres - Minneopa State Park 80 acres - Goodhue-Pioneer State Trail 60 acres - M.L. 2017, Subd. 09c "Minnesota State Parks and State Trails Land Acquisition", \$1,500,000, thru 6/30/2020 - M.L. 2015, Subd. 09a "State Parks and State Trails Land Acquisitions", \$1,500,000, completed 6/30/2016 - M.L. 2013, Subd. 04a "State Parks and State Trails Land Acquisition", \$1,000,000, completed 6/30/2016 - M.L. 2011, Subd. 04b "State Parks and State Trails Land Acquisition", \$3,000,000, completed 6/30/2015 - M.L. 2010, Subd. 04d "State Park Land Acquisition", \$1,750,000, completed 6/30/2013
214	213-G	11		46	A Local-State-Federal Partnership Protects multiple public benefits on the Mississippi River	\$700,000	A partnership among the City of Baxter, Brainerd Public Schools, Camp Ripley Sentinel Landscape program and The Conservation Fund will acquire 200 acres of riparian forest on the upper Mississippi River Headwaters.	City of Baxter	Doty, Josh	Has city approved it's budget and does it include trail construction?	- 200 acres of fee title acquisition
215	199-G	10		75	SNA Habitat Restoration, Public Engagement, and Strategic Acquisition	\$6,760,265	Scientific and Natural Area (SNA) habitat restoration and improvements (1000+ acres), increased public involvement, and strategic acquisition (700+ acres) will conserve Minnesota's most unique and rare resources for everyone's benefit.	MN DNR	Booth, Margaret (Peggy)	- What is status of LSOHC request? - Way too much cost per acre. Better priorities to fund and too big of ask.	- Similar or identical to LSOHC proposal "DNR WMA and SNA Acquisition Phase X" for \$5,934,700 includes only 25% for acquisition of SNA approximately 250 acres - Continuation - Fee Title Acquisition of 700 acres and Restoration of 1,000 acres - Budget includes \$144,265 proposed for DNR Direct & Necessary expenses - \$5857 per acre for 700 acres of fee title acquisition - M.L. 2017, Subd. 09b "Scientific and Natural Areas Acquisition, Restoration, Citizen Science and Engagement", \$2,500,000, thru 2020 reduced from \$4,500,000 in 2017 legislative session - M.L. 2016, Subd. 09a "Scientific and Natural Area Acquisition and Restoration", \$1,386,000, thru 6/30/2019 - M.L. 2015, Subd. 09c "SNA Acquisition, Restoration, Enhancement and Public Engagement", \$4,000,000, thru 6/30/2019 - M.L. 2014, Subd. 07a "Scientific and Natural Area Acquisition, Restoration, Improvement and Citizen Engagement", \$2,540,000, completed 6/30/2017

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216	205-G	8		60	Mesabi Trail, County Road 88 to Ely Segment	\$600,000	3.5 mile long bituminous surface trail beginning at the intersection of Hwy 169 and County Road 88 to Ely. In Ely, connection will be made to existing Mesabi Trail.	St. Louis and Lake Counties Regional Railroad Authority	Manzoline, Robert	What is status of entire trail?	-Continuation -M.L. 2017, Subd. 09g "Mesabi Trail Development", \$2,269,000, thru 2020 -M.L. 2016, Subd. 09e "Mesabi Trail Segment from Highway 135 to Town of Embarrass", \$1,200,000, thru 6/30/2019 -M.L. 2015, Subd. 09i "Mesabi Trail Development Soudan to Ely - Phase II", \$1,000,000, thru 6/30/2018 -M.L. 2014, Subd. 07c "Mesabi Trail Development - Soudan to Ely Segment", \$1,000,000, completed 6/30/2017
217	215-G	7		40	Prioritize and Target north-central Minnesota Lakes for Protection	\$1,492,500	This project will complete 18 permanent conservation easements, 30 forest management plans, and 20 best management practices (BMP) around Aitkin and Crow Wing Counties highest quality lakes.	Crow Wing Soil and Water Conservation Districts	Barrick, Melissa	Too much money.	- Conservation Easements - Crow Wing & Aitkin Soil and Water Conservation Districts - Permanently protect estimated 540 acres (\$2,407 per acre) - Budget includes \$4,300 for miscellaneous supplies - Budget includes \$117,000 for Easement Stewardship to BWSR - Budget includes BWSR Direct Support Services budget has no detailed information and generally these are ineligible expenses - M.L. 2016, Subd. 08f "Forest Management for Mississippi River Drinking Water Protection", \$300,000, thru 6/30/2019 - No accomplishments from current project to date
218	208-G	6		55	Mississippi Blufflands State Trail - Red Wing Riverfront	\$920,000	Construction of an engineered and designed three-quarter mile segment of the Mississippi Blufflands State Trail along Red Wing's Mississippi River riverfront, from Barn Bluff Regional Park to Colvill Park.	City of Red Wing	Owens, Jay	Seems a bit expensive. Is there enough local match?	- State Trail Segment - Construction of 0.75 mile, 12 foot wide recreational trail segment - Secured \$1,655,667 in other funding from City of Red Wing General Fund and FHWA Scenic Byways Planning TAP funding
219	212-G	6		47	Swedish Immigrant Trail Segment within Interstate State Park	\$2,254,665	Swedish Immigrant Regional Trail connection through Interstate Park to Taylors Falls City Hall. Build 180 bridge and trail segment A&B as illustrated. Segment C reviews and engineering only.	Chisago County Environmental Services	Mork, Laird		- Concern about putting a trail through a culturally sensitive area and a State Park - Budget includes Bridge Construction \$950,000 - Budget includes Trail Construction \$852,612 - Regional Trail through Interstate Park

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220	203-G	4		69	Private Native Prairie Conservation through Native Prairie Bank	\$4,535,000	Native Prairie Bank will help landowners conserve native prairie through outreach to 10,000 landowners and practitioners, restoration and enhancement of 870 acres, and protection of 600 acres through conservation easements.	MN DNR	Schulte, Judy	What is status of LSOHC request? What is average easement amount over the last few years? Are the easements having the desired effect?	<ul style="list-style-type: none"> - Similar or identical to LSOHC proposal "Accelerated Native Prairie Bank Protection Phase VII" for \$8,000,000 - Continuation - Conservation Easements and Restoration - Budget includes \$300,000 for Conservation Easement Stewardship account - Budget includes \$30,000 for MNIT Services for Prairie Tax Exemption Database for county assessor access - Budget includes \$125,371 proposed for DNR Direct & Necessary expenses - \$4113 per acre for 600 acres of easements - \$1359 per acre for 870 acres of enhancement & restoration - M.L. 2017, Subd. 09e "Native Prairie Stewardship and Prairie Bank Easement Acquisition", \$2,657,000, thru 6/30/2020 reduced from \$3,500,000 in 2017 legislative session - M.L. 2015, Subd. 09d "Native Prairie Stewardship and Prairie Bank Easement Acquisition" = \$3,325,000, thru 6/30/2018 - M.L. 2013, Subd. 04c "Native Prairie Stewardship and Prairie Bank Easement Acquisition", \$750,000, completed 6/30/2016
221	206-G	4		57	State Park and Trail Integrated Public Information System	\$3,984,142	This project provides Minnesota State Park and Trail visitors with an integrated, next-generation information system that creates a positive, safe, and welcoming experience for all users.	MN DNR	Smith, Stacy	<ul style="list-style-type: none"> - Who will do the app development? Can the project be done in phases? - DNR should fund from existing state park money and marketing dollars. 	<ul style="list-style-type: none"> - Budget includes \$400,000 for development of mobile phone application - Budget includes \$1,835,000 for road and trail way-finding signs - Budget includes \$880,000 for Entry kiosks and electronic pay stations - Budget includes \$64,142 proposed for DNR Direct & Necessary expenses
222	210-G	4		53	Bayport St. Croix Conservation Initiative	\$550,000	Fee title acquisition for parkland to protect, reconnect, restore and make publicly accessible 11 acres of St. Croix Riverfront, including 665 feet of shoreline and natural area in Bayport, MN.	City of Bayport	Taylor, Sara		<ul style="list-style-type: none"> - Could be eligible for Local DNR Park Grant - Fee title acquisition 11 acres and 665 feet of St. Croix River shoreline - \$55,000 per acre - Potential in \$1,100,000 other funding from Washington County and City of Bayport
223	204-G	3		62	Browns Creek 40 Acre Acquisition	\$350,000	Fee title acquisition for open space project protecting up to 34 acres of high-quality natural area including 1,400 feet of Brown's Creek, a designated trout stream, in Grant, Washington County.	Browns Creek Watershed District	Kill, Karen	\$10k an acre for this type of land, too much. Little value. Not enough local match.	<ul style="list-style-type: none"> - Fee title acquisition of 34 acres - \$350,000 for 34 acres = \$10,000 per acre - Pending \$350,000 match from Washington County
224	214-G	2		46	Mississippi Riverfront Redevelopment Project	\$1,000,000	The City of Brainerd is requesting a \$1,000,000 grant for the preliminary and final design of the Three Bridges Trail, Phase 1 of the Mississippi Redevelopment Project.	City of Brainerd	Thoreen, Jim	What is the city putting into the project? How far away is this proposed bridge from other river crossings?	<ul style="list-style-type: none"> - Could be eligible for Local DNR Park Grant - Proposed phase 1 of the Mississippi Redevelopment Project - Planning, Design, Engineering only - no implementation - Budget includes \$70,000 for unknown allocation

Line #	ID #	Member Ranking	Member Conflict	Staff Ranking	Project Title	\$ Requested	Project Summary	Organization	Project Manager	Member Notes	Staff Notes
225	216-G	1		22	East Fork Des Moines River Wetland Restoration	\$1,716,192	The project includes the restoration and permanent protection of a 160-acre wetland, native buffer, and pollinator habitat along Martin County JD 50 within the East Fork Des Moines River watershed.	Martin County Drainage Authority	Forstner, Michael		- Similar or identical to LSOHC proposal "East Fork Des Moines River Wetland and Prairie Restoration" for \$2,518,800 - 5-year project - Conservation easement acquisition of a 160-acre wetland - Ditch restoration - 160 Acres for \$1,044,192 = \$6526 per acre - Can they use CREP funds?
226	211-G	0		51	Improving Hydrologic Resilience in Rural Dakota County	\$1,960,000	Improving hydrologic resilience and wildlife habitat in rural Dakota County through priority site selection, design, easement acquisition, water retention, and wetland and upland natural resource restoration.	Dakota County	West, Lisa	Too costly. Not clear on real benefit.	- Similar or identical to LSOHC proposal "Dakota County Habitat Protection/Restoration Phase VI" for \$6,250,000 - Estimated acquisition of 215 acres of conservation easements - 215 acres for \$1,200,000 @ \$5581 per acre - Secured \$490,000 in other funding from Dakota County - Budget includes \$384,000 for native grass and forb seed
227	H. Administration and Contract Agreement Reimbursement (1 Proposal/Subtotal \$135,000)										
228	217-H	2		0	Contract Agreement Reimbursement	\$135,000	Provide continued contract management and customer service to ENRTF pass-through appropriation recipients. Ensure funds are expended in compliance with appropriation law, state statute, grants policies, and approved work plans.	MN DNR	Sherman-Hoehn, Katherine		- Continuation - Appropriation to the DNR for fiscal services as directed by the LCCMR for ENRTF contract management of nonstate appropriations - M.L. 2016, Subd 10a "Contract Agreement Reimbursement", \$135,000, thru 6/30/2018 - M.L. 2015, Subd. 11b "Contract Agreement Reimbursement", \$135,000 completed 6/30/2017 - M.L. 2014, Subd. 10a "Contract Agreement Reimbursement", \$135,000 completed 6/30/2016 - M.L. 2013, Subd 08b "Contract Management", \$135,000 completed 6/30/2015

* Staff ranking - Staff applied LCCMR evaluation criteria to determine the score

Evaluation Criteria

All proposals should strive to maximize efficiency and return on investment for the proposed expenditures. Additionally the following criteria, as applicable, will be considered in evaluating proposals (additional explanation of evaluation criteria is available at www.lccmr.leg.mn titled "Additional Explanation of Evaluation Criteria"):

1. FUNDING PRIORITIES: Responds to RFP funding priorities and LCCMR Six-Year Strategic Plan for the Environment and Natural Resources Trust Fund articulated and adopted by the LCCMR.
2. MULTIPLE BENEFITS: Delivers multiple benefits to Minnesota's environment and natural resources.
3. OUTCOMES: Identifies clear objectives likely to result in measurable, demonstrated, and meaningful outcomes.
4. KNOWLEDGE BASE: Contributes to knowledge base or disseminates information that will benefit other efforts.
5. EXTENT OF IMPACTS: Results in broad, long-term impacts of statewide or regional significance.
6. INNOVATION: Employs or demonstrates innovative approaches to more effectively and efficiently solve specific environment and natural resources issues.
7. SCIENTIFIC/TECHNICAL BASIS: Reflects current scientific and technical knowledge, standards, and best practices.
8. URGENCY: Addresses an issue for which immediate future action is necessary and essential to avoid undesirable consequences.
9. CAPACITY AND READINESS: Demonstrates capacity and readiness for efforts to be managed and completed in a timely, accountable, and effective manner.
10. LEVERAGE: Leverages collaborative partnerships and additional efforts, resources, and non-state funds.